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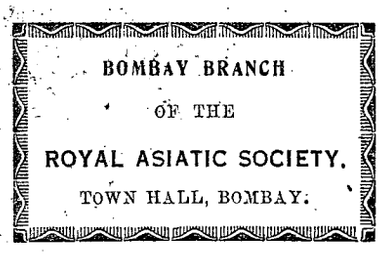

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EVIDENCE

Oral and Documentary

RECORDED BY THE

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1926.

PART I.

EVIDENCE RECORDED IN INDIA.

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CORRIGENDA.

Page	*Line*	
3	10	For "name" read "names".
4	50	For "have an" read "take any".
	60	Insert "the" before "dockyards" and "to be" before "repaired".
5	9	For "parts" read "ports".
	18	Delete "them" at end of line.
	37	For "25" read "35".
	40	Insert "had" before "agreed"; after "pay" delete remainder of question and substitute "any extra expense you might incur would you have agreed to the dredging?"
6	17	Insert semicolon after fifth word.
11	1	Delete "that".
	2	Insert "that" after "done".
	19	For "him and I" read "us".
14	21	For "report" read "reports".
16	19	Insert "on" before "by".
19	28	For "18, 28, 303" read "1, 828, 303".
22	40	Delete "th" after "$\frac{3}{4}$".
	43	Insert apostrophe at end of "Engineers".
	44	Delete "is".
23	16	Insert "still" before "hold".
	24	For "the same condition" read "the work is stopped".
	29	Insert "A." at beginning of line.
24	19	Insert "is" before "required".
	29	For the second "then" read "them".
25	13	For "are" read "do".
	26	For "not an estimate of" read "Do you not take out figures for".
26	29	Insert "them to" before "us".
28	47	For "is" read "will be".
	53	For "are included" read "do you include".
	62	For "dredger" read "dredging".
29	6	Insert apostrophe at end of "Engineers".
	37	For "that" read "they".
	54	Delete last seven words; insert (line 55) "A.—You can have it in a fortnight." Renumber remaining lines to end of page.
	65 (now 66)	Delete "not".
30	8	For "which" read "who".
	54	Insert "project" after "lakhs".
	57	For "and also" read "showing".
32	68	For "is" read "were".
33	18	Insert "do" before "you".
34	11	For "it" read "them".
	57	Delete "in".
	63	Insert "Sir George" before "Lloyd".
35	26	For "respect" read "respects".
	37	Delete "during the whole time".
	63	Insert "Mr." before "Elgee".
36	3	Insert "them" at end of line.
	5	Insert "The" before "Sir".
	19	For "alone" read "along".
	29	Insert "Q." at beginning of line.
	38	Insert "the" before "Sir".
37	23	For "lipped" read "tipped"; for "lipping" read "tipping".
	34	Delete last five words.
38	13	Insert "8" after "block".
39	2	For "They do" read "Do they".
	39	Delete last six words and substitute "per shift".
40	3	For "will" read "would".
	17	For "1924" read "1922".
40	19	Insert "with the works" before "at".
41	18	For "would lead him to have made" read "would have led him to make".
42	9	Delete "of the".
	22	For "drain" read "drains".
	54	For "pay" read "paid".
43	2	For "clay" read "mud".
	8	Delete whole line.
	56	Insert a comma after "asked".
44	4	For "and" read "who".
	16	For "20" read "£20,000".
45	34	Insert "the" before "Kalu".
48	12	Insert quotation marks at beginning and end of "for propaganda purposes".
49	53	For "whether it would be feasible" read "would it be feasible or".
50	22	For "work" read "go".
	44	For "about" read "to get". For "reckoning" read "to be be able to reckon".
55	10	For "A." read "Sir L. Hepper".
	40	Insert "of" before "being".
58	44	For "any way" read "anywhere".
	49	For "not practically" read "practically not".
59	28	For "isn't it" read "hasn't there".
	51	For "out" read "wide".
60	29	For "on" read "at".
	30	For "question, that you" read "question. You".
	34	Delete "on".
	36	For "of" read "that".
	43	Insert "Q.—" at beginning of line.
61	19	Insert "would" before "issue".
	67	For "knowledge of giving" read "right to give".
62	52	For "666" read "667".
	64	Insert quotation marks before "there" and use a capital for that word.
	65	Insert quotation marks at the end of the line.
63	23	For "of" read "for".
	45	For "in" read "on".
	56	For "enrodes" read "erosion".
64	10	For "enroded" read "eroded".
	38	For "neep" read "neap".
66	11	For "will" read "would not".
	45	Insert "the" before "dredger"; delete last word in line.
	46	For "dredger" read "it".
	48	Insert "in" after second word.
	65	Delete "is which".
67	10	Insert "the" before "cutter"; for "the" read "a".
	16	For "this" read "it".
	44	Delete "third year".
	45	Delete "completed".
68	23	Insert "a" before "detailed".
	65	Insert "in 8 months" before "against".
69	11	For "should" read "would".
71	6	Insert "with" after "on".
	8	Insert "of" after "out".
	24	Insert "it" after "disclose".
	54	Insert "you" after "asking".
	57	For "them" read "it".
	60	For "come" read "came"; for "are" read "were"; for "expect" read "expected".
72	1	Delete comma after fourth word and insert "that".

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Page	*Line*	
72	35	Insert "that" before "we".
	46	For "read" substitute "heard".
73	6	Delete last word and substitute "and".
	7	Delete first word.
	20-22	Delete sentence in brackets.
	66	Delete "Mr. S. B. Billimoria".
74	8	For "of" read "at".
	27	For "hope" read "expect".
	30	For "figure" read "figures".
75	41	Delete last two words.
76	19	For "to pile" read "piled".
	49	For "they" read "there".
	50	Delete first three words.
	69	Insert "and" before "it".
77	16	Insert "Rs." before "6,70,000".
79	21	Insert "the" before '"Kalu"'.
	35	For "likely to be used" read "available".
	38	Delete comma.
	53	Add "i-" after "mach".
80	13	For "any" read "my".
81	1	For "Buchanans" read "Meik & Buchanan".
	26	Delete comma after "all".
	30	For "on" read "over".
	47	For "their" read "the".
	69	For "Government of India" read "Secretary of State".
83	4	For "Christian" read "full".
	32	Insert "showing" after "map".
	38	Insert "denotes" after "figure".
	52	Insert "bed" after "sea".
84	59	For "dredge" read "dredger".
85	1	Insert "the" before '"Kalu"'.
	38	For "is" read "will take".
	42	Insert "get" after seventh word.
86	52	For "proceeding to have" read "of".
	54	For "insured" read "ensured".
87	9-10	Delete entire lines.
	50	For "thrice" read "twice".
	51	For "figure" read "figures".
88	2	For "12 annas" read "Rs. 1.3".
	26	Insert "the" before "cost".
89	8	For "you" read "he".
	14	For "Lloyd" read "Sir George Lloyd".
90	2	For "an hour" read "the time".
	3	For "to" read "on".
	10	Add "so" at end of line.
91	27	Insert "one" after "get".
	44	For "that you" read "to"; delete "got".
	57-61	Delete.
92	39	For "do" read "deal".
	54	For "less" read "loss of"; delete last word.
95	8	For "whole" read "old".
	9	For "1,000 £" read "£1,000".
	49	For "the ordinary engine" read "an ordinary tug".
96	6	Delete "have".
	7	For "George Lloyd" read 'the "Sir George Lloyd"'.
	9	Insert "the" before last word.
	11	For "18, 28,300" read "18,28,303".
	14	For "of" read "on".
	15	Insert "Rs." after "was".
	17	For "added" read "dredged".
	19	Insert "per cubic yard" after "rupee".
99	16	Add "the cost" at end of the line.
	24	For "required" read "expected".
	44	For "one" read "point".
100	7	For "by more" read "with more experience".
101	19	Insert "the Committtee of" before "Engineers".
	20	Insert "text of the" before "report".
	43	For "in" read "on".
	60	For "want" read "went".

Page	*Line*	
102	5	Insert "as to the way" after "satisfied".
	7	For "Were" read "Was".
	8	Insert "both" before "working".
	55	For "have" read "had".
107	5	Insert "India" before "that".
	15	For "making" read "taking".
	26	For "those" read "your".
	62	For "The" read "Its".
108	24	Insert "of your own" before "also".
	64	For "shiping" read "shipping".
111	14	For "will" read "should".
112	7	Delete "that"; insert quotation marks after "(c),".
	8	For "at" read "in".
	10	Insert quotation marks after "economised".
	11	Insert quotation marks after "say".
	12	Insert quotation marks after "Bay".
	17	Delete first twelve words and commence with capital "H".
	18	Delete first word; enclose first eight words in quotation marks.
	52	For "it takes" read "does it take".
	60	Insert "a" before "large".
	61	Insert "A" before "Small".
113	13	Insert "It is possible" after "Q.—"
	49	Insert "were" at end of line.
	60	For "began" read "was doing when it began".
116	14	Insert "a" before "suction".
	16	Insert "the" before "Sudan".
	18	For "you had" read "had you".
	46	Insert "the" before "proportion" and "of" before "solid".
117	1	Delete last two words.
	3-4	Delete.
	16	Insert "the" before "Nile".
	47	For "how" read "with the way".
118	34	Insert "the" before "start".
	42	Delete "No".
	48	For "to" read "at".
119	1	For "How much, you think," read "By how much do you think". Delete "if".
	2	For "it will" read "will it".
	28	Insert "the" before "cutter".
	38	Insert "the" after "that".
	64	For "we may" read "if we".
120	13	Insert "it to" before "you".
	17	For "you got" read "did you get".
	41-42	Delete.
	49	For "some" read "someone".
	57	For "in" read "up".
122	15	For "into the" read "on to the price".
123	6	For "of" read "at".
	62	For "correct" read "actual".
124	10	Insert "Rs." before "1.7"; for "correct" read "actual".
	30	Insert "by" before "about".
	31	For "asks" read "asked".
	49	Add "the amount" at end of line.
	54	For "sick" read "laid up".
	57	For "the waggon" read "a waggon"; delete last word.
125	35	For "are" read "is".
	36	For 'are" read "is".
126	20	For "It is" read "Is it".
128	25	Insert "the" before '"Kalu"'.
	30	Insert "that" before "this".
	32	For "acting" read "action".
131	36	For "of cubic yards by" read "cubic yards of dredged".
	37	For "dredging" read "filling".
	45	Delete "for".
132	4	For 'millions" read "million".
	5	Delete "total".

Page	Line	
133	24	For " as " read " to that which ".
134	54	For " had never " read " never had ".
	58	Insert " did " before " Mr."; for " did all " read " do it all ".
135	6	For " poles " read " piles ".
	39	For " build " read " built ".
	41	Insert " a " before " gantry ".
	42	For " they " read " this ".
	55	For " Kolaba " read " Colaba ".
136	2	For " stones " read " stone ".
	4	Insert " had " before " to ".
	29	For " had " read " have ".
137	12	For " them " read " it ".
	22	For " putting " read " put ".
	31	Insert full stop after " estimate "; use capital letter for " what ".
138	11	Add " none " at end of line.
140	8	For " What for " read " Why ".
141	39	For " drain " read " drains ".
	52	For " drain " read " drains ".
	54	For " dredgers " read " dredged material ".
142	45	Delete " in " after " crores " and substitute " according to ".
143	64	For " costed " read " cost ".
150	47	Insert " the " before " question ".
153	32	Insert " a " before " more ".
154	12	Insert " Merchants' " before " Chamber ".
155	9	For final " the " read " their ".
	10	Delete " of the Engineers ".
	26	For " potentially " read " particularly ".
156	15	Delete whole line.
	16	Delete first three words.
	19	For " 307 " read " 367 ".
159	4	For " concede " read " consider ".
160	4	Insert full stop after " think "; begin new sentence with " Until ".
163	1	For " Symons " read " Simons ".
	7	For " Symons " read " Simons ".
	22	Delete " in a contract ".
164	9	Insert " A.—" before " It ".
	12	Add " here " at end of line.
	36	Insert " the " before " Secretary ".
167	24	For " and nothing " read " but ".
	57	Insert " them " after " upon ".
	60	Insert " the " after " seen ".
	62	Insert " us " after " tell ".
	65	For " That is " read " Those are ".
168	2	For " that has " read " has that ".
	3	Insert " a " after " have ".
	4	For " it has " read " they have ".
	8	Insert " the " after " from ".
	10	Insert " the " after " than ".
	18	Insert " the " after " hope " and after " when ".
	23	Insert " the " after " making " and " a " after " pump ".
	25	Insert " the " after " about ".
	26	Insert " the " after " about ".
	48	For " part " read " past ".
170	63	Add " and greater " at end of line.
	64	Delete first word.
171	60	For " estimates " read " the estimate ".
173	54	Insert " they have " after " that ".
174	36-38	Delete.
	39	Insert " do " before " you ".
	56	Transfer " each " from before " property " to before " keep ".
	62	Insert " you know " after " month ".
175	36	Insert " the " before " Sir ".
	56	Insert " prepared " before " from ".
176	61	For " the " read " his ".
179	9	Insert " the " after " that ".
	35	For " turn " read " third ".
	42	Insert " are lost " after " hours ".
180	30	For " Mr. " read " Messrs. ".
	34	For " it " read " the change ".
	55	For " in " read " on ".
183	8	Delete " just enough " and " 5 feet ".
183	17	For " Would how much " read " By how much would ".
185	4	For " that " read " for which ".
	28	For " there were " read " were there ".
187	7	For " drain " read " water drains ".
	8	For " documents " read " document ".
	28	For " is " read " was ".
188	23	For " are " read " is ".
189	12	Insert " of " after " speaking "; for " since the time " read " the time since ".
	24	For " draw " read " dredge ".
190	17	For " quantity " read " quality ".
193	4	Delete fifth word.
	24	For " softness " read " hardness ".
	29	For " soft " read " stiff ".
	30	For " softness " read " stiffness ".
	50	Add " that is, £27,375 " at end of line.
194	6	For " not that " read " there not ".
	44	For " exploit " read " explore ".
197	19	For " how " read " why ".
	34	For " it " read " in ".
	44	Insert quotes before " when ".
	45	Insert quotes after " her ".
198	15	For " cursery " read " cursory ".
	16	Insert " at " after " purchased ".
203	25	For " railway " read " railways ".
	40	For " what " read " the ".
205	2	For " be " read " have been ".
	27	Insert " a " before " comparatively ".
	36	Delete " 39 millions "; insert " from 39 millions " after " dredging ".
206	56	For " wake " read " take ".
	61	For " Crab " read " Grab ".
207	48	For " Mr. " read " Sir George ".
209	6	For " would " read " could "; delete last four words.
	26	Insert " more " before " quickly ".
210	26	Insert " the " before " sanctioned ".
211	36	Delete first sentence.
	56	Insert " do " after " What ".
	57	For " will " read " would ".
212	33	For " wagon " read " wagons ".
	38	For " to " read " of ".
	60	For " *has* " read " *includes* ".
215	10	For " Meik, Buchanan & Co." read " Meik & Buchanan ".
	42	Insert full stop after conditions; begin fresh sentence.
	49	Insert " and " after " scheme ".
	50	Insert full stop after " equilibrium "; begin fresh sentence.
	51	Insert " the " before " Honourable ".
	54	Substitute comma for semicolon at end of line.
217	42	For " bad " read " hard ".
	55	For " but " read " and ".
	62	For " lead " read " help ".
218	60	For " under " read " in view of ".
222	7	For " as " read " at ".
	37	For " made " read " had ".
224	49	Insert " at " before " that ".
225	21	For " took " read " take it ".
	23	For " was " read " were ".
	43	For " said " read " say ".
226	32	Insert " the " before " whole ".
	54	Insert " it " after " judge ".
227	6	For " won't " read " would not ".
	14	For " lakhs " read " crores ".
	50	Delete " that " following " places ".
228	23	Insert " been " after " had ".
	61	For " spoke " read " said ".
229	60	For " now " read " how ".
231	24	For " Re. " read " Rs. ".
	35	For " yard " read " yards ".
232	43	Delete " a ".
234	8	Add " so " at end of line.

Page	Line	
235	37	For "received" read "revised".
236	6	For "deep" read "deeper".
	14	For "got" read "hard to get".
237	59	For "not she" read "she not".
238	41	For "take" read "record".
	48	For "expect" read "expected".
239	24	For "to work" read "in working"
243	1	For "keeps the water interior of" read "sweeps within".
	15	Insert "do" before "you".
	32	For "price" read "prices".
244	32	Insert "a" before "certain".
	34	Add "health" at end of line.
	37	Delete.
	52	Insert "a" before "very".
	53	For "stagnaceant" read "stagnant".
245	24	Insert "the" before "health".
246	47	For "lesser" read "less".
	48	For "no" read "not".
250	25	Insert "the" before "second".
	33	Insert "to" after "up".
251	33	Insert "so" after "said".
	37-38	Delete.
	39	For "Did" read "Had".
	61	For "have you" read "you have".
253	29	For "Soudon" read "London and".
	34	For "Goicey" read "Joicey".
254	36	Delete "and water it".
	44	For "at the depth" read "at a depth".
	46	For "does" read "did".
257	39	For "not it" read "it not".
	61	For '"Colaba"' read '"Lloyd"'.
258	39	For "grater" read "grates".
	41	Insert "an" before "ocean".
	48	For "arrangement" read "arrangements".
259	23	For "hand" read "hard".
260	1	For "comes" read "come".
	32	For "had" read "did".
	37	For "two-third" read "two-thirds".
	41	For "up" read "down".
262	40	For "morrum" read "moorum".
264	1	For "landed at low water" read "grounded".
	29	For "vast" read "much".
265	7	For "mad" read "hare".
266	13	Delete "with".
	19	Insert "not" after "could".
	48	Delete "sealing of".
267	13	For "it is" read "is it".
	19	Delete last four words and substitute "clay".
268	39	For "Yes" read "No".
271	14	Insert "to" before "a".
	45	Delete "at least".
272	11	Delete last word.
	24	For "200 to 300" read "100 to 200".
	25	For "300" read "200".
	26	For "400" read "300".
274	47	Insert "that" after "Not".
275	48	Insert "for" before "them"; for "have" read "be".
276	1	For "keep" read "have".
	47	For "is not there" read "is there not".
279	26	Insert "the dredgers" after "for".
	37	For "get" read "give".
	38	Insert "stipulated" before "output".
280	24	For "makers" read "builders"
	25	For "aright" read "right".
	32	For "give" read "deliver".
281	13	For "wolud" read "would".
283	55	For "wlil" read "will".
286	28	For "to start fresh accounts" read "for a fresh account".
	41	For "by" read "with".
287	7	For "sounding" read soundings".
288	10	For "seen" read "read".
290	14	Delete first word.
292	40	For "was" read "is".
	45	For "have constituted" read "constitute".
	51	Insert "to be" before "done".
296	50	Add "out" at end of line.
297	43	Insert "do" before "you".
	57	For "Fredrick" read "Frederick".
299	27	For "mud" read "moorum".
300	4	For "conditinos" read "conditions".
	26	For "was" read "is".
301	9	Delete last six words.
	10	Delete first six words.
302	36	For "them of" read "of them."
304	5	For "is it not" read "have they".
	25	For "guarantee" read "guarantees".
305	17	For "of" read "between"; for "with" read "and".
	32	Insert "of the" after "future".
	40	For "damage" read "damaging".
	57	For "travels" read "travelled".
309	4	Insert comma after "fair".
	5	Insert comma after "sold".
	6	For "was worth" read "would be worth".
	7	For "was" read "would be".
	33	For "dry" read "wet".
	43	For "makers" read "builders".
310	6	Delete last word.
	52	For "square" read "cubic".
311	29	For "sead" read "sea".
	31	For "of" read "prepared by".
	36	For "forms" read "form".
	56	Delete first three words.
312	36	For "moter" read "motor".
313	42	Add "so" at end of line.
	47	Add "so" at end of line.
314	4	For "pumping" read "pump".
318	41	Delete last word.
	57	For "10-ton" read "5-ton".
	58	For "500" read "£500".
	59	For "300" read "250".
321	49	For "had" read "have".
	53	Delete "and".
324	42	Insert "a" before "few".
	62	For "also say the" read "say of the".
326	8	For "it not much useful" read "them not much use".
	18	Insert "a" before "difference".
	63	Delete "a".
327	28	For "is it not" read "will there not".
329	16	Insert "that" after "now"; for "are" read "were".
	27	For "annoped" read "annoyed".
	30	For "machine" read "machines".
330	14	For "then" read "them".
	42	For "executive" read "execution".
	61	For "pou" read "you".
331	60	For "railwaps" read "railways".
349	14	Enclose "Sir George Lloyd" in quotes.
	38	Enclose "Sir George Lloyd" in quotes.
	43	For "therefor" read "therefore".
350	30	For "will" read "would".
351	15	Insert "the" before "Reclamation".
352	7	Insert "are" after "also".
	22	Delete comma after "resorted" and insert it after following word.
	23	Insert "be" after "this".
355	50	For "on" read "in".
357	7	For "24,000,000" read "2,40,00,000".
358	30	Insert "per square yard" after "45".
	57	For "club" read "Turf Club".
361	6	Delete last word.
	18	For "some" read "a".

Page	Line	
361	21	For " are " read " were ".
	22	For " are not turning out the right outturn " read " were not giving the specified output "; for " are " read " were ".
	43	For " like " read " that ".
	49	For " they were " read " it was ".
362	5	Insert " under " after " is ".
	18	Delete " we had ".
	36	Insert " and " before " 50 ".
363	6	Delete " Rs.1-12-0 ".
	7	Delete first word.
363	16	For " of " read " to "; insert " work " after " carrying ".
	17	Insert " increase " after " per cent ".
	26	Insert " it " after " transfer ".
	28	Insert " per brass " after " 1-8-0 ".
	29	Insert " to supply it at " before " Rs. 2-3-0 ".
364	8	For " have placed " read " be in the place of ".
	37	For " suggesing " read " suggesting ".
365	23	Add " useless " at end of line.
	41	For fourth word read " for ".
	49	For " of it means " read " indicates that they were ".
	59	Delete first four words and substitute " which was ordered ".
	60	For " page " read " pages "; for " receipt " read " receipts ".
366	6	For first word read " Their ".
	7	For " whether " read " why ".
	21	For first two words substitute " whose tenders were ".
	54	Insert " it " after " make ".
	61	For first five words of second sentence substitute " It is ".
367	45	Delete last word.
369	42	For " regards " read " far as ".
375	29	For " the question " read " questions ".
	41	For " bulged " read " bulked ".
377	27	For " I should look up " read " I could look it up ".
381	40	Insert " A. J." before " Billimoria ".
382	37	For " draining " read " drawing ".
383	27	Insert " the " before ' " Kalu " '.
	32	Insert " the " before " expert ".
	47	For " for " read " at a ".
	50	Insert " the " before ' " Kalu " '.
	59	For " Zinga " read " Jinga ".
	61	For " Zinga " read " Jinga ". For " Simon and Co. " read " Wm. Simons & Co. ".
384	4	For " 400 " read " 4000 ".
	6	For " Zinga " read " Jinga ".
385	7	Delete " as " before " some ".
	16	For " of " read " with ".
	21	For " large " read " larger ".
	62	Insert " when " after " days ".
386	8	For " affluenced " read " affluent ".
390	36	For " to " read " at ".
391	8	For " country " read " county ".
	24	For " acreable " read " acreage ".
394	46	For " The Chairman " read " Sir M. Visvesvaraya ".
395	16	For " Chairman " read " Sir M. Visvesvaraya ".
	31	For " Chairman " read " Sir M. Visvesvaraya ".
399	29	For " makers of machinery " read " builders of dredgers ".
401	15	Add " syndicate " at end of line.
	61	Insert " for " after " search ".
402	18	For " translation " read " transaction ".
403	11	For " it of " read " of it ".
	23	For " 9 " read " 7 ".
	28	For " natural " read " nature ".
404	8	For " mistake " in second question read " mistakes ".
404	55	For " alterior " read " ulterior ".
405	3	Delete " but ".
	23	Delete " in ".
	33	Delete " not ".
	56	For " fund " read " funds ".
	61	For " won't " read " don't ".
	62	For " it " read " them ".
406	23	For " this " read " these".
	31	Insert " he " after " Had ".
407	22	For " contract " read " contracts ".
	26	Insert " more " before " efficient ".
408	24	For " reference to " read " terms of reference of ".
	31	For " three-quarter " read " three-quarters ".
410	4	Delete words in brackets.
415	3	Insert " p " to complete " department ".
416	57	For " The Chairman " read " Sir M. Visvesvaraya ".
417	60	For " The Chairman " read " Sir M. Visvesvaraya ".
418	26	For " The Chairman " read " Sir M. Visvesvaraya ".
420	36	For " The Chairman " read " Sir M. Visvesvaraya ".
421	64	For " can " read " can't ".
422	6	For " Chairman" read " Sir M. Visvesvaraya ".
	25	For " Chairman " read " Sir M. Visvesvaraya ".
	35	For " Chairman " read " Sir M. Visvesvaraya ".
	39	For " make " read " give ".
423	1	For " Chairman " read " Sir M. Visvesvaraya ".
	23	For " Chairman " read " Sir M. Visvesvaraya ".
424	7	For " Chairman " read " Sir M. Visvesvaraya ".
	27	For " Chairman " read " Sir M. Visvesvaraya ".
	43	For " Chairman " read " Sir M. Visvesvaraya ".
	49	For " Chairman " read " Sir M. Visvesvaraya ".
	53	For " Chairman " read " Sir M. Visvesvaraya ".
	57	Insert " the best " after " get ".
	58	For " Chairman " read " Sir M. Visvesvaraya ".
425	50	Delete comma after " inconceivable " and insert " and ".
	51	For " productive " read " unproductive ".
426	35	For " Chairman " read " Sir M. Visvesvaraya ".
	52-53	Delete.
	54	Delete first sentence.
	57	For " Chairman " read " Sir M. Visvesvaraya ".
427	11	For " would " in second sentence read " might ".
	29	For " will " read " may "; delete " about ".
	31	For " would want to " read " might not ".
	34	For " Chairman " read " Sir M. Visvesvaraya ".
	40	For " field " read " ground ".
	41	For " that " read " it "; for " purpose " read " purposes ".
	49	For " Chairman " read " Sir M. Visvesvaraya ".
	52	For " Rs. 3-4-0 " read " 12 annas ".
428	11	For " on " read " one ".
	25	For " Chairman " read " Sir M. Visvesvaraya ".
	28	Insert " there " after " residing ".
	52	For " to " read " for "; for " dirth " read " dearth ".
429	8	For " Chairman " read " Sir M. Visvesvaraya ".
	64	For " Chairman " read " Sir M. Visvesvaraya ".

Page	Line	
434	5	For "The Chairman" read "Sir M. Visvesvaraya".
434	37	For "The Chairman" read "Sir M. Visvesvaraya".
	61	For "The Chairman" read "Sir M. Visvesvaraya".
435	19	For "required" read "require".
	43	For "discontended" read "discontented".
	58	For "The Chairman" read "Sir M. Visvesvaraya".
437	55	Delete "which".
439	26	For "Chairman" read "Sir M. Visvesvaraya".
	31	For "hubbub" read "hub".
441	6	For "of" read "to".
442	47	For "at" read "for".
448	53	For "The Chairman" read "Sir M. Visvesvaraya".
449	12	For "The Chairman" read "Sir M. Visvesvaraya".
	16	For "The Chairman" read "Sir M. Visvesvaraya".
	31	For "The Chairman" read "Sir M. Visvesvaraya".
	57	For "The Chairman" read "Sir M. Visvesvaraya".
450	6	For "Chairman" read "Sir M. Visvesvaraya".
452	17	For "case" read "bars".
	29	For "Chairman" read "Sir M. Visvesvaraya".
	40	For "Chairman" read "Sir M. Visvesvaraya".
453	40	For "made" read "make".
454	57	For first four words substitute "As far as possible".
458	27	Insert "a" before "small".
	34	Insert "not" before "to".
459	35	For "least" read "lowest".
460	9	For "100" read "£100".
	34	For "bazar" read bazaar".
461	21	For "he" read "it".
465	15	Insert "A.—" at beginning of line
466	31	For "712.79" read "702.79".
469	55	For "still" read "steel".
470	16	Insert semicolon after "Scheme".
	55	Insert full stop after "Commissioner".
477	23	Insert "a" after "him".
	24	For "as" read "and"; for "are" read "will".
	25	Insert "be" before "good"; delete "to".
481	15	For "Chairman" read "Sir M. Visvesvaraya".
	17	Insert "to" before "you".
	51	Insert "Mr." before "Billimoria".
482	13	For "Chairman" read "Sir M. Visvesvaraya".
	25	For "The Chairman" read "Sir M. Visvesvaraya".
	47	For "Chairman" read "Sir M. Visvesvaraya".
483	28	For "Chairman" read "Sir M. Visvesvaraya".
484	6	For "Chairman" read "Sir M. Visvesvaraya".
	52	For "Chairman" read "Sir M. Visvesvaraya".
485	28	For "Chairman" read "Sir M. Visvesvaraya".
	39	For "Chairman" read "Sir M. Visvesvaraya".
485	60	For "Chairman" read "Sir M Visvesvaraya".
486	21	For "Chairman" read "Sir M. Visvesvaraya".
	41	For "Chairman" read "Sir M Visvesvaraya".
	52	For "Chairman" read "Sir M. Visvesvaraya".
487	40	For "Chariman" read "Sir M. Visvesvaraya".
	50	For "Chairman" read "Sir M. Visvesvaraya".
488	29	For "Chairman" read "Sir M. Visvesvaraya".
489	1	For "Chairman" read "Sir M. Visvesvaraya".
	12	For "Chairman" read "Sir M. Visvesvaraya".
490	6	For "Chairman" read "Sir M. Visvesvaraya".
	15	For "Chairman" read "Sir M. Visvesvaraya".
	41	For "Chairman" read "Sir M. Visvesvaraya".
491	23	For "Chairman" read "Sir M. Visvesvaraya".
	36	For "Chairman" read "Sir M. Visvesvaraya".
	40	For "Simsons" read "Simons".
492	1	For "Chairman" read "Sir M. Visvesvaraya".
	40	For "other" read "others".
493	18	For "Chairman" read "Sir M. Visvesvaraya".
	22	Insert quotes before "Will".
	23	Insert quotes at end of line.
494	29	Insert "was" before "the" and delete after "Kalu".
495	23	For "Chairman" read "Sir M. Visvesvaraya".
	50	For "not rather" read "rather not".
	52	For "Chairman" read "Sir M. Visvesvaraya".
496	32	For "Nepoleanic" read "Napoleonic".
	33	For "Nepolian" read "Napoleon".
	52	Insert "to do" after "going".
497	6	For "disapproved" read "disproved".
	17	For "Chairman" read "Sir M. Visvesvaraya".
	24	For "approved" read "proved".
	33	For "Chairman" read "Sir M. Visvesvaraya".
	37	For "Chairman" read "Sir M Visvesvaraya".
	42	For "Chairman" read "Sir M. Visvesvaraya".
	45	For "Chairman" read "Sir M. Visvesvaraya".
	48	For "Chairma" read "Sir M. Visvesvaraya".
	59	For "Chairman" read "Sir M. Visvesvaraya".
	61	For "Chairman" read "Sir M. Visvesvaraya".
498	3	For "Chairman" read "Sir M. Visvesvaraya".
		For "Chairman" read "Sir M. Visvesvaraya".
500	17	For "Chairman" read "Sir M. Visvesvaraya".
	37	Insert "built" after "been".
	50	Insert "its" after "into".

EVIDENCE (ORAL AND WRITTEN) RECORDED BY THE BACK BAY ENQUIRY COMMITTEE

Hon'ble Sir Grimwood Mears, Kt.	Chairman.
Sir M. Visvesvaraya, K.C I.E., D.Sc., M.I.C.E.	Members.
Sir Frederick Hopkinson, K.B.E., M.I.C.E.	
Mr. S. B. Billimoria, M.B.E., J. P.	
Mr. R. B. Ewbank, C.I.E., I.C.S.	Secretary.

The Committee met at 11-0 a.m. on August 3rd at the Civil Secretariat, Bombay

1st Witness

A. W. W. Mackie, Esq., I.C.S., Deputy Director, Development Department

Chairman.—Mr. Mackie, what are your Christian names ?
A.—Alfred William White Mackie.

Chairman —Are you a member of the Indian Civil Service ?
A.—Yes, Sir.

Q.—What is the position you are holding at present ?
A.—I am acting Deputy Director of Development, acting Secretary to Government in the Development Department, and acting Commissioner of the Bombay Suburban Division.

Q.—When did you first become associated, if at all, with the Bombay Reclamation Scheme?
A.—On the 1st April 1926.

Q.—Are you here today in the main as a formal witness to produce certain documents which it is necessary that we should have ?
A.—Yes, that is how I understand it.

Q.—Have you got the documents there ?
A.—I have already supplied the documents, I have got a list of them.

Q.—Will you give the list of documents to us. Have you got the list in order of dates ?
A.—I have got it in chronological order except where otherwise necessary.

I produce to this committee the following documents :—

(1) Outline of History of the Scheme compiled from Government records.

(2) Reports of the Committees of 1887, 1897, and 1907.

(3) Report of the Military Lands Committee, 1904.

(4) Report of Messrs. Lowther Kidd & Co., 1912.

(5) Report of the Committee which investigated this scheme in November 1913.

(6) Sir George Buchanan's Report of September 1919.

(7) Correspondence leading up to the Secretary of State's sanction of the scheme and the method of financing it.

(8) Correspondence leading up to the appointment of Messrs. Meik & Buchanan as Engineers of the Scheme.

(9) Speech of H. E. Sir George Lloyd, Governor of Bombay, introducing the Bill further to amend the City of Bombay Improvement Act, the City of Bombay Municipal Act.

(10) Correspondence with Messrs. Meik & Buchanan regarding the execution of the works, and the termination of their agreement.

(11) Reports by Sir George Buchanan on his visits to Bombay.

(12) The first and second *ad interim* Reports of the Advisory Committee.

(13) Correspondence and notes regarding the termination of the agreement of Messrs. Meik & Buchanan, and the responsibility of the firm in connection with the Back Bay Reclamation Scheme.

(14) Correspondence and notes with Messrs. William Simons & Co., Sir John Biles and Sir George Buchanan with regard to the stiffening of the intermediate pumping station, " Colaba."

(15) Memorandum by Sir George Buchanan to the press regarding the Black Bay Reclamation Scheme.

(16) Report of Sir Alexander Gibb on the Scheme.

(17) Copy of Debates.

(18) Report on some results of the work done by " Jinga " and " Kalu ".

(19) The Annual Reports of the Development Directorate since its formation.

(20) A Press Note publishing correspondence with Mr. K. F. Nariman regarding charges made by him against the Development Directorate, and

(21) Copy of the Reply of Mr. Nariman to the last letter of Government included in the Press Note.

Q.—These documents have been supplied by you to Mr. Ewbank, the Secretary ?
A.—Yes, Sir.

Chairman.—Are you prepared to give us some information about the origin and progress of the scheme ?
A.—No, I am not.

Sir Frederick Hopkinson.—I take it that this is the complete list of all facts and figures ?
A.—No, it is not a complete statement of all the details by any means. Any papers on any point—every paper in the possession of Government, confidential or otherwise—will be produced at once.

Q.—These papers cover all the main points ?
A.—Yes, they go right through from beginning to end. These are official papers, and will presumably only be published when the reports or appendices are published ; only the parts required for the reports or appendices will be published.

Mr. Billimoria.—What position did you hold before taking over your appointment in the Development Directorate ?
A.—I was Collector of Ahmednagar.

Q.—You had nothing whatever to do with the Development Directorate before April 1926 ?
A.—Nothing whatever.

Q.—After you had taken over charge, was it ever brought to your notice that a report had been made by Mr. Jacob of New York which was published in the report of the Bombay Development Directorate in 1914 ?
A.—A witness referred to it in giving evidence before one of the committees, in which he said it was a mad project. I forget the exact language, but it was strong.

Q.—Why is it not produced when you have produced other documents ?
A.—I do not know whether we have got this report. I do not know the exact year of the committee. Anything that you want will be produced.

Q.—You have been in this Department from April 1926 ; I presume you have read all the papers in connection with this scheme ?
A.—No, I have read only those papers in connection with matters with which I had to deal. Regarding most of it I know little or nothing ; for instance, I have had to deal with the stiffening of the " Colaba ". There are many other points which I have not gone into at all.

Q.—So, with regard to the past history, you would not be able to throw any light ?
A.—Not beyond the production of papers.

Chairman.—You spoke about the privileged nature of the papers. Of course, the documents, which are put into the possession of the Members of the Committee, are definitely privileged, and could not under any circumstances be communicated to any outsider, but every document that is read or referred to in this room will naturally be printed in the press and no privilege can attach to it ?
A.—Yes, Sir.

Q.—However privileged a document is, when the document is a matter of discussion in this room, whatever takes place is or can be published in the press ?
A.—Yes, Sir. I quite understand it.

Q.—The discussion, I take it, of any extracts or anything that is discussed, anything that you say or anything that is read in this room may be published ?
A.—I fully understand it.

Sir M. Visvesvaraya.—Which other official, do you think, would be able to give us the information about the origin of the scheme and the various stages through which it has passed ?
A.—Mr. R. D. Bell, the man for whom I am acting ; Mr. J. R. Martin also is due in India, I think, towards the end of this month.

Q.—Can you not collect the information?
A.—Certainly.

Q.—What about Mr. Monie? Is he in India?
A.—He is retired.

Q.—Where is he at present?
A.—I do not know his address in England. It can be got by communication. He was associated with the scheme from the beginning.

2nd Witness

Captain E. J. Headlam, Director, Royal Indian Marine

Chairman.—Will you tell me your Christian name?
A.—Edward James.

Q.—What is your present position?
A.—I am Director of the Royal Indian Marine.

Q.—How long have you been Director of the Royal Indian Marine?
A.—Since September 1922.

Q.—Had you any connection with the Royal Indian Marine in March and June of 1921?
A.—I was Deputy Director.

Q.—You can speak to the events of March and June and onwards, 1921?
A.—Oh, yes, I have been Deputy Director since 1920.

Q.—When did the question come up before the Royal Indian Marine of the proposed dredging operations in the Harbour in relation to the Back Bay Scheme?
A.—Just previous to August or in the beginning of August 1921.

Q.—Do you know, as a matter of fact, that the question had arisen previously in March 1921 with the Port Trust?
A.—Oh, yes, I do know that.

Q.—And then in August 1921, the question had to be considered by the Royal Indian Marine?
A.—Yes, it was on the 17th of August 1921 that Admiral Mawley, the then Director, wrote his letter to the Director of Development.

Q.—Have you got the correspondence?
A.—Yes, all that we have in our office about it. That was written by Admiral Mawley after he and I discussed the question.

Q.—Did the Development Directorate submit a map to you showing the area over which they proposed to dredge?
A.—Yes.

Q.—Was that map examined by the experts of the Royal Indian Marine?
A.—The matter was discussed by Admiral Mawley, the Director, myself, and the Commander of the Dockyard, who is responsible for mooring.

Q.—Were you of opinion that, in the interests of Royal Indian Marine, the proposed dredging could be allowed to the extent to which the Development Directorate wished?
A.—No, they wanted to go too deep.

Q.—Ultimately, did the Port Trust and the Royal Indian Marine, in conjunction with each other, considerably limit the area of the proposed dredging works?
A.—Oh, certainly. We did not refuse to have dredging done over the area; we simply limited the depth that the dredging must be done.

Q.—That is to say, the dredger was designed to work down to 70 feet below water level?
A.—Yes.

Q.—You refused to allow the dredger to operate lower than 35 feet?
A.—That is right.

Q.—And the reason for that was anchorage amongst others?
A.—Yes, anchorage for the Indian Marine and for men-of-war, etc.

Q.—And to that decision of the Royal Indian Marine, the Development Directorate had to submit?
A.—Yes, they did acquiesce.

Q.—You and the Port Trust were the authorities?
A.—Yes.

Q.—The scheme was announced on the 3rd August 1920 by Sir George Lloyd. Before 3rd August 1920, had the Royal Indian Marine been consulted at all as to whether dredging would be permitted?

A.—Before August 1920, not that I remember.

Q.—At all events, is there any indication that there had been any consultation?

A.—No. I was officiating as Director, and I should have known it.

Q.—Had the Royal Indian Marine been doing any dredging?

A.—We have to dredge continuously to keep our dockyard open.

Q.—Did the Government of Bombay ask your opinion or advice as to the feasibility of dredging on a large scale?

A.—No.

Q.—Or as to the nature of the sea bed?

A.—No.

Q.—Or as to the experience which you had gained from the use of dredgers of any particular type?

A.—We had never been consulted.

Q.—As far as you know, no consultation of any kind on any of these points took place?

A.—The only consultation that we had in connection with the reclamation scheme was with regard to taking over our dockyard. But there was no question of dredging.

Q.—Did Sir George Buchanan ever make similar enquiries from you as to whether dredging would be freely allowed?

A.—No.

Q.—Or the feasibility of the scheme?

A.—I never discussed it with him at all.

Q.—As far as you know, Sir George Buchanan made no enquiry of the Royal Indian Marine as to any of these matters of which I spoke?

A.—No.

Q.—There was a map which passed between the Port Trust and the Development Directorate and between the Royal Indian Marine and the Development Directorate?

A.—The first information we had was the production of this map. I think it was a map that we have not got in our office.

Q.—Did any other person, apart from the Government of Bombay and Sir George Buchanan, approach the Royal Indian Marine to obtain information on these matters?

A.—Not to my knowledge.

Q.—Do you happen to have a copy of the map showing the area which is restricted?

A.—I have not got a copy of that map.

Q.—The actual original map will be in the possession of the Development Directorate?

A.—I should imagine so.

Sir M. Visvesvaraya.—Doubtless you have copies of that map. Could you very kindly give us one?

A.—I will send you a chart of Bombay with the actual limits of the Royal Indian Marine. I could send you a map on a fairly large scale. I could send it in half an hour.

Q.—What was the area which has been excluded from the operation?

A.—I could not tell you the area because we do not measure it in acres. It is between Apollo Bunder and the Middle Ground really.

Q.—Have you studied the question of reclamation? Do you have an interest in it?

A.—I take a great interest.

Q.—Have you any opinions of your own to give?

A.—Yes, I have been here the whole time it has been going on.

Q.—To what extent does the restriction affect the estimate?

A.—It is such a small portion it did not appear to us important at all. Afterwards some one said that our particular portion held the best soil, whatever it is, for reclamation purposes. But we had no idea. It was a very small portion of the harbour.

Q.—Have you studied the question of the suction dredger plant?

A.—We have had one of the dredgers in dockyards repaired.

Q.—Speaking generally, what do you think are the reasons for the failure of the dredger to give the required output?

A.—The length of the pipe line I imagine is too long. I imagine that is the reason.

Q.—It did not function properly because the pipe line was too long?

A.—The pipe line is not always perfectly straight.

Q.—That was put in the specifications originally ?
A.—I do not know.

Q.—Have you any opinion as to what extent the reclamation should be completed, in a general way ?
A.—My own opinion is that in a great city like Bombay the whole of it should be completed.

Q.—But what about the cost ?
A.—No. I have not gone into the question of cost.

Q.—In what parts is such reclamation being carried on at present ? Karachi is one ?
A.—Karachi, Cochin and Tuticorin.

Q.—Do you happen to know what it is costing them per 100 cubic feet ?
A.—I do not know. In the case of Cochin which I visited 2 years ago they are doing the same thing they did at Durban in South Africa. They are developing the harbour, dredging and reclaiming the same moment, which means they are deepening the harbour, and instead of taking the silt out to sea they are putting it on shore.

Q —You have no idea as to what it is costing them ?
A.—No, the Engineer in Cochin should know them.

Q.—What other suction dredgers are working in this harbour ?
A.—I do not know the exact number and size of the Port Trust Dredgers. Ours is the only one I have control of. It is the bucket dredger.

Q.—What is the maximum output of a dredger ?
A.—It all depends on the size and what it is working at.

Q.—You have no dredger of the dimensions they have purchased for the reclamation ?
A.—No

Sir F. Hopkinson.—In his letter dated 12th September 1921 to the Secretary of the Port Trust, Sir Lawless Hepper refers to the limitation of the dredging and says : "This will mean a shortage of the material for reclamation to the extent of nearly 15,572,900 cubic yards and this quantity is proposed to be recouped by an extension of the dredging area out in the harbour from middle ground to the southern boundary of the area originally proposed." Is that the report you have been referring to ?
A.—That is right. I imagine that that is the total limitation. We said that we were quite willing to allow dredging to be carried out down to about 35 feet but we heard afterwards from Sir George Buchanan that these few feet we were content to have dredged on was not the good stuff they wanted, and it was ordinary silt, and that if they dredged 25 feet they would not get the good stuff they wanted. If they went up to 70 feet of water there would have been practical danger to shipping.

Sir M. Visvesvaraya.—There is a very large margin between 35 feet and 70 feet, but supposing that they agreed to pay the cost of extra moorings, would it have affected you so long ?
A.—Our moorings have to be lifted every year, all our dockyard buoys and moorings have to be increased in weight and size, so there would be continual extra charge but as it was there was no pressure. They accepted our objection and we were never asked to reconsider our decision.

Mr. Billimoria.—Do you think, Captain, that the dredging would have endangered the property of the Port Trust if the dredging was not restricted in the area of the Port Trust ?
A.—It would have meant the same effect as on my area. It would have rendered the moorings unsafe to shipping.

Q.—Would you limit the area because it was unsafe for the harbour ?
A.—We only have control over a very limited area which is definitely marked on the chart, and I would decline to have it dredged down to 70 feet.

Q.—Did the Development Department consult you on the area before they raised any objection ?
A.—They did not consult us about any particular area. They simply showed us our own area.

Q.—Have you reclaimed any area for the Port Trust ?
A.—No. I was not then a Trustee of the Port Trust. I have been one since 1922.

Q.—In answering a question of the Chairman you just now mentioned that you have to carry on dredging every day. Where do you throw the stuff that you take out of the dredging ?
A.—There is a portion of the harbour set apart where the dredgers can go and where it would do no harm.

Q.—That means that the material is simply wasted. Is it of no use?

Do you think that material could have been very well utilised by the Development Department if it had been taken from you?

A.—I was concerned only with silt deposits, and there would be no means of getting it out unless you have a specially built dredger which would discharge the silt through a pipe straight to the shore. The only other means are barges.

The 3rd August 1926, at 3 p.m.

3rd Witness

Sir Lawless Hepper, Kt., Director of Development

Chairman.—Did Messrs. Lowther and Kidd report upon the practicability of reclaiming 1,145 acres in Back Bay on the 3rd of August 1912?

A.—Yes.

Q.—The report, in fact, was prepared by Mr. W. Kidd?

A.—It was.

Q.—Did the Government of Bombay on the 30th of May 1919 ask Sir George Buchanan of the Firm of Messrs. Meik and Buchanan to report on Mr. Kidd's scheme?

A.—They asked Sir George Buchanan, at that time Sir George Buchanan was not a member of the firm.

Q.—Do you happen to know roughly when he became a member of the firm?

A.—It was in 1919, after he was asked to prepare the report and prior to the submission of the report.

Q.—Was that report in the hands of the Government of Bombay in October 1919?

A.—It was.

Q.—Was it on August 3rd, 1920, that Lord Lloyd, then Sir George Lloyd, announced the decision of the Bombay Government to reclaim the Back Bay in accordance with Sir George Buchanan's report?

A.—It was on the 3rd of August 1920.

Q.—Did Sir George Lloyd in the same speech announce the intended formation of a body to be called the Development Directorate and were part of their duties indicated—the first duty mentioned, the duty to carry out with the assistance of their engineering staff the Back Bay reclamation scheme and any other reclamation schemes which may be found necessary in or near Bombay city?

A.—Yes.

Q.—The Development Directorate had many other activities besides Back Bay?

A.—Yes.

Q.—And they are all set out year by year in the report of the Development Directorate?

A.—Yes.

Q.—But the Back Bay Reclamation Scheme was of all the most important?

A.—It was the most important.

Q.—Were you appointed Director on the 8th of November 1920?

A.—Yes.

Q.—Have you remained in that position ever since?

A.—I have.

Q.—Were you assisted by two groups of gentlemen, Secretaries and engineers?

A.—The engineers were directly under me, and I and the engineers form the directorate, which is the executive part of the organisation to carry out the work. The Secretary to Government in the Development Department occupied a dual position. He was Deputy Director of Development as well as being Secretary to Government in the Development Department. All the orders of Government were, in all questions, issued over his signature as Secretary to Government in the Development Department. He formed a sort of link between the Secretariat and the executive part of the organisation.

Q.—Was the first Chief Engineer, Mr. Lewis, appointed on the 11th of December 1920?

A.—I have not got the exact date. It was in December, I think.

Q.—Mr. Lewis was appointed on the 11th December 1920, and except for the fact that in 1922 he was away on leave from May to October, did he remain as Chief Engineer until the 12th of July 1924?

A.—Yes.

Q.—There was also a Mr. G. M. O'Rorke who acted as Chief Engineer during the period of Mr. Lewis's absence on leave?

A.—Yes, that is correct.

Q.—And then Mr. H. A. Elgee, who was appointed on the 12th of July 1924, and except for a short period of leave, has been one of the engineers to the scheme and is to-day the Chief Engineer?

A.—Yes.

Q.—Then as regards Secretaries, Mr. P. W. Monie was appointed on the 8th of November 1920, and acted until the 8th of July 1922?

A.—Yes.

Q.—And was Director for part of the time up to 7th October 1922, during which period you were on leave?

A.—Yes, I was on 3 months' leave.

Q.—Mr. J. R. Martin followed Mr. Monie on the 8th of July 1922, and remained in that position until the 28th of November 1924?

A.—Yes.

Q.—And he acted as Director whilst you were away for another period of 3 months?

A.—Yes.

Q.—And then Mr. R. D. Bell succeeded Mr. Martin on the 5th of July 1924 and was in that position until the 1st of April 1926?

A.—Yes.

Q.—So that we have got yourself as Director, 4 gentlemen who from time to time had been Secretaries including Mr. Mackie, and 3 gentlemen, whose names I have mentioned, as Engineers?

A.—Yes.

Q.—Now what position did the firm of Meik and Bachanan occupy as regards the scheme?

A.—They were appointed engineers to the Secretary of State for carrying out the scheme.

Q.—Do you accept the description which Sir George Buchanan himself has given in a letter of July 1922 that they were the actual responsible engineers to the scheme?

A.—I have always considered that they were.

Q.—Do you accept his statement?

A.—Yes.

Q.—The proposed reclamation was a very big undertaking?

A.—It was.

Q.—Can you give us any instance of a reclamation on an open sea front ever having been attempted on the same scale?

A.—I do not know of one.

Q.—Had you in November 1920 any previous practical experience of reclamation on an open sea front?

A.—No.

Q.—Had Mr. Monie or Mr. Martin or Mr. Bell, so far as you know?

A.—No, none of them.

Q.—What about Mr. Lewis? Was Mr. Lewis nominated by the firm of Meik and Buchanan?

A.—He was nominated by them.

Q.—Was or was it not a fact that the Government of Bombay could require Sir George Buchanan's attendance here in India for a period of months, such as 7 months in the year?

A.—He was to be in Bombay at the commencement of every working season and stay as long as Government considered it necessary, and he was also under an obligation to come to India in the Monsoon if Government so desired.

Q.—Therefore, taking your answer, if Government had said "we require your presence in India" he would have been bound to come for a period of not less than 7 months in the year?

A.—I do not think any actual period was laid down. I do not think it would have been unreasonable.

Q.—The phrase is "the major part of the year"?

A—Yes.

Q.—So Sir George Buchanan nominated Mr. Lewis. Now with regard to Mr. Lewis, do you happen to know where Mr. Lewis is at the present moment?

A.—He was in England when we heard of him last, but I have no doubt the Chief Engineer will have his address.

Q.—Would you tell us what experience, as far as you know, Mr. Lewis had of a work of this character?

A.—He had been employed under Sir George Buchanan at the time when Sir George Buchanan was Chief Engineer and Chairman of the Rangoon Port Trust, and I understand that considerable river training works were carried out there by Sir George Buchanan, and presumably Mr. Lewis was working on those works, but exactly what his part was I am unable to say. Then subsequently when Sir George Buchanan was employed in Mesopotamia, reclamation works were carried out there with the "Kalu", which is now working for us, and I understand that Mr. Lewis was also working on those works under Sir George Buchanan.

Q.—The Rangoon undertaking was a river one?

A.—That was a river training work.

Q.—What was the Mesopotamian one?

A.—The Mesopotamian one was making wharves at Basra about 70 miles up the river.

Q.—Again inland?

A.—Yes.

Q.—With regard to Mr. G. M. O'Rorke, was he an Engineer nominated by Sir George Buchanan?

A.—He was.

Q.—Can you help us at all with regard to his experience?

A.—I am afraid I cannot give any details.

Q.—Were you associated with him daily from 1922 throughout the period in which he was acting?

A.—Yes.

Q.—Did you ever discuss with him what had been his previous experience of reclamation on an open sea front?

A.—I cannot say I did. He has been employed the whole of his time at the quarry at Kandivli.

Q.—And Mr. Elgee who was appointed on the 12th July 1924, was he nominated by Sir George Buchanan or not?

A.—He was.

Q.—You have been good enough to furnish us with a statement and we may take that as being in the main your evidence?

A.—Yes.

Q.—Would you kindly turn to the bottom of the first page where you are speaking of the survey of Lowther and Kidd carried out in 1912. You say drawing No. 5 shows the results in detail of this part of your investigation. Have you got in the office of the Development Directorate drawing No. 5?

A.—I think we have all these drawings in the Chief Engineer's office.

Q.—Turning over to page 2, you point out that Mr. Kidd spoke of the clay as being stiff and unctuous and later about the middle of the page he speaks of it as blue clay?

A.—Yes.

Q.—Whatever description he used, whether he called it stiff or hard or unctuous or merely clay, he does not indicate any doubt as to the capacity of a dredger to deal with it. He says, "The machinery we would employ would be designed and guaranteed to effect the removal of 2,000 cubic yards of silt or blue clay per hour; that is, without the addition of the words "hard or unctuous"?

A.—Yes.

Q.—But taking the whole of Mr. Kidd's report whatever description he used of the clay, he appeared to have no doubt that a dredger would be capable of dealing with it?

A.—Yes.

Q.—In your statement you very rightly point out that Sir George Buchanan recommended the purchase of a dredger designed to discharge soft clay, that is page 2, about line 35, and you emphasise the point that Kidd spoke of stiff and unctuous clay whereas Sir George Buchanan spoke of soft clay. Later you speak of it as one of the mistakes which has proved disastrous. That I suppose is your considered opinion?

A.—Yes.

Q.—Were you not quite pleased with the quality of the clay down to March 1924?

A.—The dredger began to work on the 8th of December 1923.

Q.—And the date I am putting to you now is March 1924. Were you not quite pleased with quality of the clay down to March 1924?

A.—We were quite pleased with it as material for reclamation. But I do not think we had realised then that it was going to result in reduced output.

Q.—I am now reading from the report on the working of the Development Department for the year 31st May 1924, page 2, "The material obtained proved to be of much better quality than had been anticipated, being a hard, heavy clay with sand"?

A.—Yes.

Q.—So that up to March 1924 you were approving of a hard heavy clay?
A.—As material for reclamation.

Q.—Is there anything in this report ending 31st May 1924, which in any way speaks of the disadvantages of hard, heavy clay?
A.—No, I do not think there is.

Q.—And was it on account of the hard heavy clay that it was considered by Sir George Buchanan that a saving of 17 lakhs could be effected by doing away with some of the bunds?
A.—Yes.

Q.—And that was mentioned with satisfaction in this report?
A.—Yes.

Q.—When you became Director in November 1920, I suppose there had been some preliminary consultations before your appointment?
A.—I had been asked by Sir George Lloyd about the end of December 1919 whether I would take up this appointment and after a good deal of discussion I finally agreed to it some time towards the end of January.

Q.—At about what date, as far as your recollection serves you, did you first see Kidd's report and Buchanan's report?
A.—I went on leave for six months on the 1st of May or about that time, and some time prior to that I was shown a copy of Sir George Buchanan's report, about April 1920.

Q.—And knowing that there was a possibility of your becoming Director did you have a copy of the report before you went on leave?
A.—I do not think I had a copy of my own. Mr. Kidd's report was not shown to me. Before the 1st of May 1920 I saw Buchanan's report.

Q.—Did you at that date study it carefully?
A.—No, I cannot say I did.

Q.—But when you became Director in November 1920, you must of course have studied Kidd's report and Buchanan's report with very great care?
A.—I had to study it in connection with the preparation of the revised estimate. That was one of the most important things we had to do at the beginning. I read all the papers I could in connection with it.

Q.—All I am concerned with for the moment is Mr. Kidd's report and Buchanan's report. Am I right in assuming that you studied them with great care?
A.—I studied Buchanan's report with great care, but I am not sure that I studied Kidd's report with great care till some time later.

Q.—Were you satisfied with Buchanan's report?
A.—At that time I had no reason to think that there was anything unsatisfactory except as regards the estimate.

Q.—Except for the prices, your study of Buchanan's report satisfied you?
A.—Yes.

Q.—And, of course, in reading a report like that your previous training as a Royal Engineer would give you an advantage over a layman in studying documents of that description?
A.—It would, I think.

Q.—Did you notice in your study of Buchanan's report that he had described the clay as soft clay, whereas Kidd described it as stiff and unctuous?
A.—Yes.

Q.—Did it strike or have any effect on your mind in 1920?
A.—It did not.

Q.—It may turn out later of course that the discrepancy is not of any importance, but when first was it that you realised what to-day you are alleging that the difference in description has been one of the mistakes which have proved disastrous? When did that strike you?
A.—It struck me after the first season's dredging.

Q.—The first season's dredging ended about May 1924. How long after the end of the first season's dredging?
A.—It was about the end of that season. We had correspondence with Meik and Buchanan and brought to their notice the very low output compared with the specification and discussed it with the engineers. The engineers expressed their opinion that the clay was of much harder nature than had been specified.

Q.—Did you in that correspondence make the point that whereas Kidd had spoken of stiff and unctuous clay Buchanan had described as soft clay?
A.—No.

Chairman.—And ever since that time have you had the gravest misgivings about the success of dredging?

Sir Lawless Hepper.—I have been doubtful about it. Sir George Buchanan in 1924 assured Government that the results of the first season were purely experimental and that no estimates should be based on them and that we ought to wait until the first complete season, which was 1924-25, before we arrived at any conclusions.

Q.—But from May or June 1924 have you always had in your mind that this difference in the description of clay was a matter likely to cause disaster?

A.—I began at that time to have doubts as to whether the output would come up to the standard that was specified.

Q.—That is in May or June 1924 you appreciated the point which is emphasised at page 10 of your report:—

[The Chairman here read out paragraphs 27 (1) and 27 (6) of witness's written statement.]

Would it be fair to say that from May 1924, you were personally uneasy about the amount of dredged filling that would be deposited within the reclamation area?

Sir Lawless Hepper.—Yes, I was.

Chairman.—Did you in your Development Report for the year ending the 31st March 1925 make any reference to this point—'stiff, unctuous and soft'?

A.—No.

Q.—But it had been in fact in your mind some nine months before the publication of this Report?

A.—Yes.

Q.—Mr. Kidd's Report in 1912 shows that he had complete confidence in the practicability of the scheme?

A.—Yes.

Q.—Sir George Buchanan's report shows that he had complete confidence in the scheme if carried out as he proposed?

A.—Yes.

Q.—Had you while reading Sir George Buchanan's report, yourself any doubt as to its complete practicability?

A.—None whatever.

Q.—Mr. Kidd and Sir George Buchanan were both of opinion that the scheme would prove to be a great financial success; is that right?

A.—I think they were.

Q.—Had you, at the time you assumed the Directorship of the Development Directorate, any doubt yourself that the scheme would prove to be a great financial success?

A.—No.

Q.—One of the objects of the sea wall was of course to retain what was pumped into it?

A.—Yes.

Q.—Did you notice the particular type of sea wall which Sir George Buchanan advocated?

A.—Yes.

Q.—Did you consider in November 1920 that that particular type of sea wall as advocated by him would in fact prove satisfactory?

A.—We had no experience that would lead us to believe that it would not be.

Q.—Do you mean to say that there was nobody in the Development Directorate who had sufficient practical experience to say whether a wall of that description would retain the material?

A.—The Chief Engineer would certainly have some experience.

Q.—As you yourself said, and very fairly, you had not got practical experience to enable you to say whether from the engineering point of view that wall would retain the material pumped in?

A.—Yes, I had no previous experience of work of this class.

Q.—Was it Sir George Buchanan's proposal to commence the building of the wall from both ends?

A.—Yes.

Chairman.—I will come to that a little later on. But the present position is that the sea wall has been entirely built with the exception of 1,850 feet in the centre?

A.—Yes, that is so.

Q.—When the Government of Bombay approached the Government of India with a view to secure the Government of India's sanction to the scheme the estimate that was put forward was 367·61 lakhs?

A.—Yes.

Q.—It was, I suppose, on the basis of that being the price that at which the work would be done, the Government of India sanctioned the scheme?

A.—I think so.

Q.—Soon after you took office, it became necessary to look into the figures of Sir George Buchanan's report?

A.—We were required by the Accounts Department to prepare detailed estimates in the usual course. There had been no detailed project estimate prepared before.

Q.—Therefore, soon after you assumed your duties this detailed project estimate was prepared?

A.—Yes.

Q.—At that time you had to assure yourself very carefully whether there was a considerable rise in the prices of machinery, fuel, labour and plant, and to submit figures that would prove approximately to be correct?

A.—Yes.

Q.—And the figures of the detailed project estimate came to 702·43 lakhs?

A.—Yes, that is the figure.

Q.—Did that figure rather disturb you?

A.—I was not unprepared for it. It was Mr. Lewis who had been working on the estimates for some time before it was actually submitted by him and I and Government knew that there was likely to be a considerable increase over Sir George Buchanan's estimate on account of alterations in prices. Sir George Buchanan had himself also submitted a revised estimate in 1922 which was considerably in excess of his previous estimates.

Q.—There is no doubt the prices were at that time going up, but the point I want to put to you is this: the scheme which might be well worth undertaking at 367 lakhs might not be a scheme worth undertaking if it is going to cost you 702 lakhs? Did you ever consider it from that point of view?

A.—We had a forecast worked out on the basis of the 702 lakhs estimate and assuming the land would be disposed of in 11 years, which was at the time considered reasonable, the whole scheme showed a profit. It was worked out on the basis of Rs. 28 per square yard. It rose from Rs. 40 to Rs. 60 per square yard later on.

Q.—Did it ever occur to you personally to consider whether in the circumstances it might be prudent to wait until trade conditions were more settled?

A.—I did not think that the 702 lakhs estimate was likely to result in the scheme proving a financial failure because I thought that the prices that had been suggested in the earlier forecast at Rs. 28 per square yard were very low and that it was not unreasonable to consider somewhat higher prices.

Q.—At about that date, on the 28th February 1921, do you recollect Sir Chimanlal Setalvad saying that the cost per square yard will be about Rs. 10·15 and, at a very modest estimate, the profit would be at least 30 crores?

A.—Yes, I remember that statement.

Q.—Then you estimated, at a very modest estimate, the financial yield of this undertaking would be 30 crores?

A.—Yes.

Q.—Did you believe that it was of a character that would bear the additional burden of the difference between 367 lakhs and 702 lakhs?

A.—Sir Chimanlal's statement was made in 1921.

Q.—There had been other statements too, but what I am asking is, did you consider that the financial prospects were sufficiently good to make it worth while to go on even at 702 lakhs?

A.—I think so.

Q.—The dredger "Sir George Lloyd" arrived in March 1922? (When I am referring to dredger "Sir George Lloyd" I shall say "dredger" and the dredger "Kalu" will be called by name.)

A.—Yes.

Q.—It began work on the 8th December 1923?

A.—Yes

Q.—Therefore she was laid up for a period of 21 months?

A.—Yes, 21 months.

Q.—The cost of the dredger and plant connected with her was about £450,000?

A.—Something like that.

Q.—And interest at £450,000 for 21 months at 5 per cent. is £40,000?

A.—Yes.

Q.—I am taking the cost as £450,000 including the cost of pipe line, and taking this figure as an approximate one, it meant a loss of £40,000 by locking up all this capital?

A.—Yes.

Q.—Suppose instead of beginning the sea wall from both ends at the same time, it had been decided to commence the sea wall either from block 8 or from block 1, and enclose block 1 or block 8 as early as possible, could not the dredger have begun work in October 1922?

A.—I do not think so, because the dredger cannot work in Back Bay in any case. It was confined to the harbour.

Q.—Suppose it were decided to enclose block 8 and to carry a bund from the extremity of the sea wall to the shore, would you not have got the lagoon that you wanted? If you had not been building the sea wall from both ends, could not have the lagoon been ready by October 1922?

A.—I do not think so. The delay in completing the sea wall in block 8 was due to the necessity of laying a railway alongside the foreshore down to Colaba, putting in sidings and making preliminary arrangements for filling. Also the first 2,000 feet of sea wall was built directly on the reef, which meant that the foundations could be built only at low tide.

Q.—The point that we must go into with some care, is as to whether, if the work of building a sea wall and a cross bund to an extent necessary to enclose block 8 had been concentrated upon, would not a whole season of the working of the dredger have been gained?

(The witness made note of this point which he said the Chief Engineer would answer fully.)

Q.—The points which are given in your report, which I am coming in a moment, must have been taken from some progress reports?

A.—They are based on reports submitted by Chief Engineer.

Q.—At one time was it the idea of the Development Directorate that one lagoon should be completed so that the dredger could get to work at once?

A.—Yes, but we had not yet completed block 8; we had a smaller compartment.

Q.—The passage to which I am referring is the "Report on the working of the Development Directorate" during the period ending 31st March 1921, and it says that the dredger is due to arrive in Bombay after the monsoon of 1922 when it is expected to have a compartment of the reclamation area ready for filling.

A.—At that time we hoped we should have a compartment on 31st March.

Q.—You hoped that by October or November 1922, there would be a compartment ready for filling?

A.—Yes.

Q.—Of course it would have been of very great advantage if you could in October or November 1922 have got the dredger pumping material into block 8. It would have saved a year?

A.—Yes, it would have.

Q.—Now in your statement you give us the number of pumping hours at page 3. Are these hours the combined working hours of "Sir George Lloyd" and "Kalu".

A.—No, they are of "Sir George Lloyd" only.

Q.—The estimated number of working hours was 2,550 for 170 days in the season?

A.—Yes.

Q.—In point of fact, instead of doing that in the season 1923-24, the dredger did less than one-third of these working hours—843?

A.—Yes.

Q.—And a year later the working hours came to 1,473?

A.—Yes.

Q.—The addition of these two, *i.e.*, 843 and 1,473, gives you still a less figure than the one working season figure estimated by Sir George Buchanan?

A.—Yes.

Q.—There must have been both in 1923 and 1924 considerable interruptions and considerable delays?

A.—In 1923-24 the dredger did not commence until 8th of December and then almost immediately after commencement, there was bad weather and considerable damage was done to the pipe line. Throughout the season we had trouble because the anchors that had been supplied for holding the pipe line were not heavy enough and the tides were very strong and the pipe line was continually getting out of position and breaking. It was not until we got a complete new set of heavy anchors that we were able to get the work going in the season. I think also that during the preliminary period, the staff had not become fully trained.

Chairman.—Is that by the end of December?

A.—By the end of financial year, ending 31st March 1924.

Q—Instead of getting 2,000 cubic yards per hour you got a total of 627 cubic yards per hour?

A.—Yes, of actual filling.

Q.—Taking the year 1924-25, the 1,473 pumping hours is a little more than half the number of pumping hours given in Buchanan's report?

A.—Yes.

Q.—Both the time that the work would take and the cost that the work would involve depended upon Sir George Buchanan's calculation that the dredger would work continuously 15 hours a day for 170 days of the year delivering each hour 2,000 cubic yards of consolidated filling?

A.—Yes.

Q.—That was the essence of it?

A.—Yes.

Q.—The moment you drop down from 2,550 to 1,473, the cost and time is going to increase in the proportion of 14 to 25, that is, your progress is going to fall below that which was estimated?

A.—That is so.

Q.—As regards annual reports, has there been one published in 1926?

A.—It has been in the press for some time. I hope to get copies out in a day or two. I can supply them in the course of a day or two.

Q.—The document is one intended to give to the public the history of the working of the Development Department in all its many branches?

A.—Yes. It is meant to be a record of progress.

Q.—That is to say, anybody interested in Bombay turning to these volumes would find the report on the working of the Development Department in all the matters which were from 1920 entrusted to it?

A—Yes. It has been a little difficult in the case of Back Bay reclamation to deal with technical questions because the Director who writes the report is not the technical official. The officials in charge of technical matters are Messrs. Meik and Buchanan.

Q.—Who actually has been writing these reports?

A.—I have myself.

Q.—Apart from any question of the technical side, you were desirous no doubt to represent to the public exactly how the Back Bay Development scheme was progressing?

A.—As far as concerned the amount of work done each year, but I did not, in the early stages, begin to throw doubts on the financial part of it, because we were not sure what was going to happen, and Sir George Buchanan said that matters were going to improve in the future, and I did not want to cast doubt prematurely.

Q.—Take the figures of March 1925. This is how the report opens: "Work on the Back Bay Reclamation Scheme made steady progress during the year." Would you turn to page 3 of your statement and look at the figure 1,473 pumping hours as compared with 2,550 stipulated number? Could that be said to be steady progress?

A.—It was not progress at all like the estimates.

Q.—When you tell the general public that work on the Back Bay Reclamation Scheme made steady progress during the year, do you not mean them to assume that the progress was according to the estimate and according to the plan?

A.—I do not think I meant that.

Q.—In fact, the work as you told us of the dredging was not making steady progress?

A.—It was not making the progress that it would have done if it had proceeded in accordance with Sir George Buchanan's estimate.

Q.—On consideration was it an accurate statement to say that during this time work on the Back Bay Reclamation Scheme had made steady progress?

A.—There had been no interruptions. Of course, from the point of view of actual output of the dredger, it was extremely disappointing. But the question was, at the time I wrote the report the figures having been just placed before Government for that season, whether the Government would wish me to give information about the financial effect of the low output at that stage. That was always my difficulty.

Q.—Now the question is as to whether Government would wish you to give any information of the difficulty?

A.—The figures for the season's dredging are only available towards the end of June each year and it is at that time that the report is drafted, and there was no time to calculate the effect of those figures.

Q.—You knew that the dredger had been working for 1,473 pumping hours. We knew that to carry on the scheme you had to work 2,550, and therefore as regards that operation of dredging far from there being steady progress there was a most serious failure of output?

A.—Yes.

Q.—That must be so, it follows?

A.—Yes.

Q.—Was nothing done at the floating pipe line end to estimate at all what volume of filling was coming through it?

A.—No, I do not think so. I do not know whether it could have been done.

Q.—You have said that you did not know whether Government would like you to indicate the facts as in truth they were?

A.—What I meant was that we did not know what the effect on the financial prospects of the scheme a reduction of the output of this kind was likely to have. I did not think it desirable to say too much about it until that aspect had been gone into.

Q.—In October 1922, sanction was given by the Government for the revised estimate. When you were dealing with this matter in the report of 1923, did you speak of it at all as a revised estimate?

A.—I forget what reference I made.

Q.—The point I am trying to make is this: Did the Development Directorate in any of these annual publications tell the public that the scheme had been sanctioned for 367 lakhs, and that through rise of prices the detailed project estimate had gone up to 702 lakhs. Was that ever stated in any of these annual publications?

A.—I think the figure of the sanctioned project estimate was given, but I am not sure whether any comparison was drawn between that and the original figure of Sir George Buchanan.

Q.—Was the original figure of 367 lakhs ever mentioned in any of the annual report?

A.—I do not think it was.

Q.—And the way in which this detailed cost is increased in the report is as follows, reading "the detailed project estimate amounting to 702·43 was sanctioned by Government in October 1922, the figure being almost exactly the same as that on which the information was supplied to the Indian Merchants Chamber in September 1921. There was therefore no change in the previous forecast of cost per square yard." No one reading that would think that the original estimated figure had been 367 lakhs?

A.—No, but I think that was all gone into at the time that the statement was made to the Indian Merchants Chamber.

Q.—But if this report is fairly to represent the working of the Development Directorate, it might seem that the figure of 367 lakhs should have been mentioned in one of the volumes and some reasons given for the increase to 702 lakhs. It would have given the public more information?

A.—Yes. We never looked on the figure 367 as our figure at all. We simply went by the project estimate which we prepared ourselves.

Q.—But the Government of India look upon the figure 367 as one of importance, and it was on that that sanction was given?

A.—Yes.

Q.—Continuing the reading of page 1 of the report "it depends on the time required for the execution of the project, and as to this all that can be said at present is that the indications are that a somewhat shorter period will be needed than was at first estimated." Sir George Buchanan had estimated five pumping seasons?

A.—He estimated five we estimated six which is right.

Q.—What were the indications which existed on the 31st of March 1923 that the work could be done in a somewhat shorter period?

A.—The main reason was that the wall was considerably in advance of the programme—that the construction of the wall had been quicker than laid down in the programme.

Q.—And the wall was in advance of the programme?

A.—It was. There was a regular programme for each year. If the dredging had come up to expectations, I think that the statement was not unreasonable. The dredging did not start till the following December. There were no grounds to suppose that we could not do it in time.

Q.—When were you to finish?

A.—1929-30.

Q.—For the year ending 31st of March 1925, which is the year in which you stated that steady progress had been made you give at the bottom of page 3 a statement that during the season up to the 31st March 1925 a total of some 13 lakhs of cubic yards of material had been pumped ashore and deposited in the military area so that at that date you knew approximately that 37 lakhs had been pumped short?

A.—Yes.

Q.—Am I right in saying that the proper figure to make up for the shortage would have been some 37 lakhs?

A.—Quite that. That includes the working of two seasons.

Q.—Surely not? During the season from October 1924 to 31st March 1925 a total of some 13 lakhs cubic yards had been pumped ashore and deposited in the military area?

A.—That is the work of two seasons 1924-25 and 1925-26.

Q.—At the bottom of page 3 where you give the total of 13 lakhs you are there giving the whole amount that was pumped in from the beginning of the work?

A.—I am not quite sure. I think I must have been referring to the season of 1924.

Q.—The season about which you were writing?

A.—Yes.

Q.—Then we get during the season from October 1924 to the 31st of March 1925 a total of some 13 lakhs cubic yards had been pumped ashore and deposited in the military area. That represents the total output of the dredger " Sir George Lloyd "?

A.—Yes.

Q.—Was not the proper output of that dredger for that season 5 million cubic yards?

A.—Yes, on Sir George Buchanan's estimate.

Q.—Therefore the estimate of 13 lakhs cubic yards was a most disappointing figure?

A.—It was.

Q.—Does that enable you to feel that the statement on page 1 that the work had made a steady progress deserve some qualification?

A.—What I meant was that there were no interruptions. We had a good many interruptions in previous years.

Q.—When you were working smoothly without doing very much dredging?

A.—We were losing a great deal. We had made arrangements to stop the loss in the following season.

Q.—At that rate the dredging was going to take four times as long with the consequent cost of upkeep throughout the length of twenty years, interest charges, renewals of plant, etc.?

A.—Yes.

Q.—There came a time when the Port Trust and the Royal Indian Marine stepped in and excluded a certain area from dredging?

A—Yes.

Q.—Mr. Kidd had according to him made surveys and had reported that there was three times as much material available as was necessary for the completion of the work?

A.—Yes.

Q.—It was estimated that 25 million cubic yards was the amount to be deposited?

A.—Yes.

Q.—And therefore Mr. Kidd's statement meant that there were available some 75 million cubic yards?

A.—I do not think that agrees with our figure. It is on Kidd's basis.

Q.—Mr. Kidd says it was three times as much?

A.—Yes.

Q.—According to Mr. Kidd's estimate there were 75 million cubic yards?

A.—Yes.

Q.—The areas over which the Port Trust and the Royal Indian Marine forbade you to dredge were in fact those of which Mr. Kidd had spoken highly?

A.—Yes, that is so.

Q.—And whatever was the size of the area of the Royal Indian Marine from which you were excluded, they refused to allow dredging to a depth of greater than thirty-five feet?

A.—Yes.

Q.—Whereas " Sir George Lloyd " had been constructed to dredge seventy feet?

A—Yes.

Q.—And of course to lose a solid bed of thirty-five feet was a disturbing matter? It lost 7,296,000 cubic yards. Elsewhere it has been stated to be 15½ millions?

A.—The restriction the Port Trust imposed reduced it by 8,280,000 cubic yards and the further restriction of the depth by the Royal Indian Marine reduced it by 7,296,000 cubic yards. The total is 15,526,000.

Q.—That is how you get the 15½ millions and in that way you were debarred from taking from the harbour 15½ million cubic yards of what was said to be good dredgeable material?

A.—Yes.

Q.—The immediate result was an increase in expenditure of some 28 lakhs?

A.—That came a little later. The Chief Engineer at that time when the restriction was made did propose that we should extend our area in the harbour. Later on after discussion with Sir George Buchanan, at his next inspection, it was decided to dredge in Back Bay.

Q.—The ultimate result of the refusal of the Port Trust and the Royal Indian Marine was that you went and dredged in Back Bay?

A.—Yes.

Q.—And to dredge in Back Bay required an additional expenditure of some 28 lakhs?

A.—Yes, in plant.

Q.—Is there anything said in the report on the working of the Development Directorate about the increased cost?

A.—I am not sure. I cannot remember. There have been five or six reports.

Q.—If there is, would you give me the reference to it?

A.—I would look up and see.

Q.—And is there any reference to the fact that the Royal Indian Marine and the Port Trust had deprived you of an area of 15½ million cubic yards?

A.—No, I do not think so.

Q.—Nor is there, as I think you told me, any mention of the point that you now so strongly rely on, the stiff and unctuous and soft clay?

A.—No.

Q.—Indeed, reading these reports right away through from the commencement down to 1925 could you point to any passage in them giving any cause for alarm?

A.—No, I do not think I can. The difficulty has always been, in writing these reports about the reclamation works, that we are writing about works which are being carried by the firm of Meik and Buchanan as Engineers to the Government, and they are responsible to Government to carry out the work, and it has always been rather difficult to determine how much we ought to say, and how much we ought not to say, of the details about the financial prospects.

Q.—It was a question of how much it was good for the public to know?

A.—We had to consider what the firm of Meik and Buchanan would say if we were to go and inform the public that their dredgers during the last year had not done what they were supposed to do. Sir George Buchanan has always asserted that the dredgers were perfectly capable of doing the work, and he reiterated that they were the responsible engineers, and he protested against our estimate of 702 lakhs as being much too high. It always seemed to me it was rather difficult to say anything in a report of this kind that might tend to throw discredit on Meik and Buchanan.

Q.—But why should you spare Meik and Buchanan? After all if the annual report of the working of the development directorate had set out the crudest facts that they could, and had contrasted them with the promises of Meik and Buchanan, would not something have happened; either Meik and Buchanan would have carried out their contract, or the matter would have been discussed and some re-arrangement made?

A.—The matter was discussed between Government and Meik and Buchanan.

Q.—But in a wider field?

A. I always felt it rather difficult. I do not think there is any intention to conceal anything, but it has not been altogether very easy work.

Q.—Now one of your minor criticisms of Sir George Buchanan is that he overestimated the number of hours of useful work which the dredger could perform?

A.—Yes.

Q.—When in November 1920 you were studying the report did you consider that 15 hours' work a day was practicable?

A.—I had no opinion on the subject then.

Q.—Ought you not to have had an opinion? You see in 1920 you had been in India for a good many years. You had been Agent of a Railway. You had general practical experience as a man who had held very high positions. Did it not occur to you whether 15 hours a day was a practicable proposition?

A.—At the commencement we took Sir George Buchanan's estimate. He was an expert and knew a great deal more about it than any of us. It did not occur to any of us at that stage to criticise.

Q.—Here is Buchanan putting forward the practicability of a dredger coming into Bombay, working 170 days in the year, and doing for it 15 hours a day, and as far as I know you did not dissent in any way from that. In fact you must have accepted it as practicable?

A.—Government had already accepted it, and the Development Directorate were told to go on and do the work.

Q.—But assuming Government had accepted it, suppose you had come to the conclusion that it could not have been done, would it not have been your duty to have spoken out and told the Government it could not be done?

A.—I could not have said that at the time.

Q.—If you had come to the conclusion that it could not be done, all you have got to say is, "I shall have nothing to do with it."

A.—I have come to the conclusion now, and have become wise after the event.

Q.—At that stage the question whether 15 hours a day was practical did not force itself upon your attention?

A.—For two shifts it did not seem to be unreasonable.

Q.—A 15-hours working day has up to now proved impracticable?
A.—Yes, on the average.

Q.—Did the Development Directorate or Sir George Buchanan take any borings in Back Bay just before the time when it was decided to take the "Sir George Lloyd" there?

A.—The Chief Engineer took a series of borings in Back Bay.

Q.—Before you took the Sir George Lloyd there?
A.—Before the "Kalu" was taken there.

Q.—Can the Chief Engineer produce a map?
A.—Yes, he can.

Q.—Did the Chief Engineer report the borings gave promise of success?
A.—He said there was sufficient material and it was very good material for the purpose of reclamation, but I think he indicated it would be difficult material for dredging.

Q.—And in fact they got upon very hard clay and sandstone?
A.—In the first year they did.

Q.—And the results of that dredging were disappointing?
A.—In the first year they were, owing to the necessity of the dredger having to dredge its own flotation before beginning work. It could only dredge for a couple of hours each tide, and it had then to be taken out into deep water and it meant several months elapsed before it could work continuously. I do not think the results are ever likely to be good in Back Bay, because the material is undoubtedly much harder.

Q.—When did you become a Trustee of the Port?
A.—I think somewhere about 1913.

Q.—That would be just at the conclusion of the dredging operations of the "Kalu" and the "Jinga"?
A.—I think I must have become a Trustee about 1910, not 1913.

Q.—"Kalu" and "Jinga" were dredging between 1910 and 1913?
A.—Yes, the dredging operations were going on when I was a Trustee.

Q.—Did you in your capacity as Trustee get to know between the years 1910 and 1913 the average output of the "Kalu" and "Jinga"?
A.—No, I do not think any of the Trustees had any information on the subject.

Q.—Do not matters of that character come before the Port Trustees?
A.—The Trustees went on several occasions to see the work going on, and progress plans used to come round about once a month showing the area that has been covered with mud and the area that has been covered with clay, and so far as I know the results of the dredgers were never communicated to the Trustees.

Q.—In the whole of the three years did no one to your knowledge inquire what was the guaranteed output of the dredgers and what output they were in fact giving?
A.—Nobody that I know of.

Q.—And was it quite recently that you learned that the output of the "Kalu" was 34 per cent. of its guaranteed output?
A.—I think that 34 per cent. must be a slip. I think it is 25 per cent. The figures seem to indicate a loss of 25 per cent. I drew the attention of the Chairman of the Port Trust to this but I did not hear from him.

Q.— Throughout the period 1910—1913 was the "Kalu" in fact giving far less than her guaranteed output?
A.—She gave far less. I make it 1,126 cubic yards per pumping hour for the two, "Jinga" and "Kalu".

Q.—What amounts should they have done?
A.—One dredger did better than the other. The average of the two combined works out to 1,126.

Q.—What should they have done?
A.—They were specified to do 2,000 cubic yards each. The average I get is 1,126. I think it is comparable with 2,000.

Q.—So it was doing roughly half its guaranteed output?
A.—Yes.

Q.—Did you know that fact in November 1920?
A.—No.

Q.—It would have made you hesitate about the whole plan if you had known that?
A.—Well, I might have had misgivings about it.

Q.—Suppose you had known that the "Kalu" was giving about half her guaranteed output and that the "Sir George Lloyd" was being purchased from the same firm and was of the same type, cutter suction dredger, would you not have felt it your duty to make some communication to Government or Sir George Buchanan or somebody?
A.—Certainly I would have brought it to the notice of Government at once.

Q.—And although Government had decided to go on with the scheme, Government could equally have decided to vary the scheme or even to abandon it?

A.—Yes.

Q.—In November 1920 you must have known that you as Director were hoping to dredge over a sea-bed which was the property of the Indian Marine and the Port Trust?

A.—It was part of the scheme we were to carry out that we should do so.

Q.—Did it occur to you to ask the Port Trust if there would be any objection?

A.—I do not think it did. I think they made their objections very soon though, in June 1921.

Q.—But it did not occur to you to ask them what experience they had of dredging?

A.—At that time when the work was started in 1920 the question of dredging was not one that was very much to the front, because we knew that the dredging was not going to come on for a year or so. The main question which concerned us was the opening of the quarry and the starting of the sea-wall and the construction of the Railways, and I do not think these questions about possible output and the area over which the dredgers were to work were very important at that time; at any rate we did not attach great importance to them.

Q.—But the dredging was the crux of the whole thing. Was not it?

A.—Yes.

Q.—There was no good building a sea-wall, and no good buying a dredger, unless you had material at the bottom of the sea-bed suitable for dredging. Material was the crux of the position, was not it?

A.—Yes, but the scheme had been reported on by two sets of experts and we were appointed to carry it out according to the sanctioned plan of the second expert. It never occurred to me to try to find fault with others.

Q.—But the proposal was to dredge from the harbour. You as a Trustee of the Port Trust must have been perfectly well aware that under section 28 of the Act of 1879 all right, title and interest in the stone and the rock and so on of the harbour was vested in the Port Trust?

A.—I knew that.

Q.—Therefore you knew that the Development Directorate were intending to interfere with the property which was vested in you as a Trustee of the Port Trust?

A.—We should have had to obtain their formal permission before we started dredging.

Q.—That is just the point. Did you in November 1920 appreciate that?

A.—I do not think the question ever occurred to anybody because there was no question of dredging at that stage.

Q.—Did it occur to anybody to ask the Port Trust what was their previous experience of the dredging of the sea-bed?

A.—I do not think so.

Q.—Did it occur to anybody in the Development Directorate to ask them what were the performances of the "Kalu" and the "Jinga"?

A.—No.

Q.—Or to make any inquiry from them as to their views on the feasibility of the scheme?

A.—No, we took it that Government had accepted Sir George Buchanan's advice as to the feasibility of the scheme and the cost and the time, and the dredging plant had been ordered seven months before, and we took it that our business was to go on and do the scheme as well as we could. It never occurred to us at that stage that we were intended to carry out a further inquiry into the whole project.

Q.—I am hardly suggesting that. What I am suggesting is this: that to you as Director it was of the greatest importance that Sir George Buchanan's scheme should be a sound one from an engineering point of view, and that his scheme should not show on the face of it that there were defects in it. That was of importance to you as Director?

A.—And much more so to Sir George Buchanan.

Q.—And also to you as Director?

A.—Yes.

Q.—If you had in 1920 noticed this point about the stiff and unctuous clay and soft clay, had noticed the point about the permeability or porousness of the rubble wall, had noticed the point about the practical impossibility of working 15 hours a day, if you had noticed all these things in November 1920, would you not have called the attention of the Government to all of them?

A.—Certainly.

Q.—I think I have asked you, and you have answered about the type of sea-wall. In your statement now you think the principal reasons for the, may I say, present partial failure is attributable to the mistakes of Sir George Buchanan. Is there

any other reason apart from those contained in your statement on account of which you are led to think the scheme has been a failure?

A.—No other reasons. There are no other reasons except those that I have given that resulted in the anticipated excess over the sanctioned project estimate.

Q.—Is there anything in the answers which you have given this afternoon that you would like to qualify or add to?

A.—I do not think so.

Q.—I want to make this clear about the Reports of the working of the Development Directorate. This was an official document which necessarily had to give some account of the workings of a scheme that was of a very exceptional and difficult character. That is right?

A.—Yes.

Q.—On the one hand Sir George Buchanan was saying in 1923-24 you could form no estimate because the Dredger had not had a fair trial.

A.—Yes, he said so.

Q.—And you had, I assume, the hope that Sir George Buchanan's statement with reference to the improvement would be made good in the succeeding year?

A.—Yes, we were all hoping so.

Q.—Is it a fact that in the year 1925-26 since the sea-wall has been sealed there has been a considerable improvement?

A.—Well, we have retained a very much larger amount of material. I have the actual figures. The actual quantity dredged by the "Sir George Lloyd" last season was 18,28,303 cubic yards and the actual amount measured *in situ* in June was 22,64,000 cubic yards.

Chairman.—Is it a fact that in the year 1925-26 since the sea-wall has been sealed there has been a considerable improvement?

A.—Well, it retains very much more material. The actual quantity dredged by the "Sir George Lloyd" last season was 18,28,303 cubic yards and the actual amount measured in June was 2,264,000. So it measures more than what was dredged.

Q.—That is because the clay has expanded, is it not?

A.—Because the silt is full of water. It is not dry. Our Engineers always assumed that there would be a shrinkage of 20 per cent.

Q.—Your engineers have and possibly they may be asked questions on that, but on the other hand Sir George Buchanan's contention is that far from shrinking, it bulks?

A.—Yes. I understand that his reason is that if you got clay under pressure for centuries and you release that clay and bring it out in the open it will expand?—As regards the clay, yes. But our engineers think there will be considerable shrinkage in the silt.

Q.—Is the position, at all events, that you have dredged 1,828,000 and have actually got in the wet stage 2,264,000?

A.—The Engineers Committee assume a reduction of 40 per cent. owing to the wet state. Our engineers consider this a very liberal allowance but we are not in a position to say it is excessive.

Q.—Just one or two questions about that rubble wall. There came a time when you were satisfied that a considerable amount of the pumped filling was passing through the rubble wall and escaping into the sea?

A.—Yes, in January 1924 soon after the dredging started.

Q.—And you endeavoured to impress that upon Sir George Buchanan, but whatever his opinion may have been, he did nothing?

A.—No.

Q.—And ultimately on the responsibility of the Development Department the inside of the rubble wall was sealed and the cross bund as well?

A.—Yes.

Q.—Did any one form any estimate of the depths of the sealing that was necessary—how many feet, how many yards?

A.—No, I do not think so.

Q.—There has been a very great quantity of moorum put into it?

A.—Yes. I do not think that Mr. Lewis was suggesting any design. It was Sir George Buchanan who would do what he thought necessary.

Q.—Now you are satisfied that practically the whole if not the whole of the pumped material is retained in a sea-wall and a cross bund backed by moorum?

A.—I think practically all has been retained, but I do not know what sort of reclamation is going to result.

Q.—I suppose you will be in Bombay during the next month?

A.—Yes.

Mr. S. B. Billimoria.—In connection with the steady progress made as stated in the report I hope Sir Lawless meant to indicate by his answers to the questions that Government was not anxious to disclose that the dredger was not working satisfactorily?

A.—I did not mean to indicate that Government did not want to disclose everything. The matter had been referred to Meik and Buchanan. My explanation was that we got these figures of dredging just about the time when that report was drafted, and it was only fair, I think, to give the firm who were responsible for doing this dredging an opportunity to tell Government what they had got to say about it before saying too much to the public as to what the results were. I do not think the Government in any way wished to screen the facts. Once Government were satisfied that something was going wrong there would be no intention to withhold anything. With the exception of the last season, the results of which have been fairly good, there have been two seasons pumping before that. The first one was more or less experimental, and Sir George Buchanan had very strongly urged on Government that no conclusions should be formed on the results of the first year's working, and when the results of the second year's working were found to be unsatisfactory it was referred at once to Sir George Buchanan and he was asked to come out and if necessary to arrange to bring out representatives of the makers of the dredger and have the thing gone into here.

Q.—You were responsible for the drafting of the report: it was not by the Government?

A.—No, it is not the Government.

Q.—That was keeping back information?

A.—It was simply from a working man's point of view that I drafted that report.

Q.—The inference I drew from your answer was that the Government was inclined not to disclose something?

A.—No.

The Committee assembled at 11 a.m. on the 4th August 1926, at the Secretariat, all the members being present

Chairman.—Sir Lawless Hepper, I asked you a question with regard to a statement which was said to have been made in the Legislative Council by Sir Chimanlal Setalvad, and I understood your answer to be in accordance with the Report of the speech. Also I asked you whether notwithstanding the increase of the estimate to 702 lakhs you still thought the undertaking had a prospect of success. I understood your answer to be definitely in the affirmative.

A.—It was in the affirmative.

Q.—There is a statement in one of the newspapers which is not correct, and I think I had better ask you the questions again. I was on the point as to the general belief that this undertaking would be a financial success. I asked you whether on the 28th February 1921 Sir Chimanlal Setalvad said, "Now taking the present valuation of land in the city, on a very modest estimate, the result on the reclamation would be a profit of at least 30 crores to the city. It may be more, in all probability it will be more, and in certain circumstances it may even go to 50 crores". Was that the statement that has been officially attributed to Sir Chimanlal on the 28th February 1921?

A.—To the best of my recollection that is correct.

Q.—And again on the 14th March 1921 he is officially reported to have said in the Bombay Legislative Council, "But even supposing we get land for Rs. 20, making all liberal allowances for mistakes and miscalculations, which we do not anticipate, still bearing in mind the present market value of the land, we would make very very big profit on the scheme". You are a member of the Legislative Council, are you not?

A.—I was.

Q.—Are you able to say that it was apparently the view held not only by Sir Chimanlal Setalvad, but by Government, that there would be a very big profit?

A—That was the view.

Q.—I am reported to have put this question to you, "In February 1921 do you recollect Sir Chimanlal Setalvad saying that the cost would be 32 crores". Have you any recollection of my having put that question to you?

A.—No.

Q.—The question I had put to you was whether he said there would be a profit of 30 crores, and to that you assented?

A.—Yes.

Q.—Then the report goes on, "Did you think the financial prospect sufficiently good to go on with the scheme"? My recollection is you said it was in your opinion sufficiently good.

A.—That was my reply.

Q.—What is attributed to you is, "Witness was heard to say, 'I don't think'."

A.—That is incorrect.

So it comes to this, that Sir Chimanlal Setalvad said on the 28th February 1921 and again substantially reiterated it on the 14th February that on a very modest estimate there would be a profit of 30 crores?

A.—That is right.

By Sir M. Visvesvaraya.—We understand that the Bombay Government have appointed two committees. Can you tell us what each of these committees is for and what reports they have compiled?

A.—They have appointed a small Committee of Engineers, the appointment of which was recommended in the Report of the Advisory Committee with the object of checking the estimates prepared by the Chief Engineer. Their work is simply confined to checking those estimates and reporting to Government whether in their opinion those estimates may be taken to be reasonably correct.

Q.—Are the reports sent to you or to the Government direct?

A.—They are sent to me. I submit them to Government.

Q.—What is the report of Mr. Kay's Committee for?

A.—The other Committee is the Committee which has been appointed to advise Government as to how far any further operations of the reclamation can be undertaken with reasonable prospect of reducing the present debt. The idea is that they are men who have local knowledge of prices of land in Bombay and that they would be able to produce some facts and some opinions which would be useful to this Committee.

Q.—Both those reports are going to be placed before this Committee?

A.—The report of the Engineers Committee is to be sent to Mr. Kay's Committee in the first instance, and when the report of Mr. Kay's Committee is received it will be submitted by the Bombay Government to the Government of India, and will be, I understand, by them, placed before this Committee.

Q.—I want to ask you a few questions to obtain information from your own point of view of the present financial position of the works. What is the total expenditure on the work up to 30th June 1926?

A.—I have not got that figure. I think the figure was supplied to the Secretary, but I have not got it. They can be easily got from the Accounts Office.

Q.—Could you kindly give it to us to-morrow?

A.—Yes, total expenditure including interest or without interest?

Actual expenditure excluding interest.

By Sir F. Hopkinson.—Don't you have a monthly statement made showing all that?

A.—No, we can always get it from the Accounts Officer. By the middle of the month he can give the expenditure up to the end of the preceding month.

By Sir M. Visvesvaraya.—How much filling has been done in blocks 1 and 8 against the estimates given in the statement here?

A.—As regards block 8, the totals of the figures are given on page 3. But the difficulty is how much of the filling should be taken as consolidated filling. We have got the actual measurement taken in June, which was 2,264,000 for block No. 8. These figures are for dredging only. There has been a certain amount of dry filling done as well.

Q.—Can you tell us how much filling has been done up to 30th June?

A.—I cannot give them now, but I can get them.

Q.—We ought to have a tabular statement of the material of all kinds required in each individual block, from 1 to 8, together with a statement showing how much has been put into each block.

A.—Only in blocks 1 and 8 has any material been put in.

Q.—You can give that information for those 2 blocks?

By Sir F. Hopkinson.—We should want to know how much is required in all the other blocks.

A.—It is already there in the statement attached to the Advisory Committee's Report. It gives the area and cubic contents of each of the eight blocks.

By Sir M. Visvesvaraya.—Do you accept the figures given in this table for blocks 2 to 7?

A.—These are the corrected figures, that is, for consolidated filling.

Q.—You accept them? You have checked them?

A.—Our Engineers have verified them. They were from sections taken by our own engineers. I consider them reliable.

Q.—You cannot give us the quantity of filling remaining to be done in each of the blocks Nos. 1 to 8?

A.—That was the information I was asking the Chief Engineer to get. He can get it in ¾th of an hour.

Q.—Unless we get that we cannot find out what the cost will be of completing blocks 1 and 2.

A.—We have just received the report of the Engineers Committee, and I think I am right in saying that according to their estimate for the execution of block 8 is, there is something over 4¾ lakhs of cubic yards still remaining to be done, but that all depends on how much they assume that the 2,264,000 cubic yards measured to be there now will shrink. They have assumed it will shrink 40 per cent.

Q.—I understood block No. 8 was nearing completion. The figure given in your estimate is 39 lakhs, and the quantity you have shown there is 22 lakhs?

A.—That is what was put in last season only.

Q.—You cannot give the quantity for block No. 1?

A.—That is what I am going to give.

Q.—If you are allowed to proceed with the other blocks, which is the next block you will take up, and which after that, from your own point of view as Director?

A.—I shall be inclined to take up block No. 7.

Q.—Why do you prefer block No. 7?

A.—Because it is one of the shallow blocks. It is less deep than blocks 2, 3, 4, 5, or 6.

Q.—Till recently the idea was to complete block No. 2?

A.—Yes.

Q.—Supposing Government were guided entirely by financial considerations, how many blocks would you complete, which of them and in what order?

A.—It depends upon what the future extent of filling is, and Government have undertaken to be guided in their estimates by the Report of the Engineers' committee, which was only received on Saturday, so that we have not been able to work out the cost of filling block 2 on the basis of the figures which they have approved, but we have their estimated cost of filling block 7.

Q.—What are your own conclusions on the point as the Departmental head in immediate charge and in daily contact with the work ?

A.—My own opinion is it would be a profitable thing to fill block 2. I am doubtful about the remainder. I agree with the Advisory Committee that block 2 should be filled. When the Advisory Committee's Report was written it was expected block 8 would not be completed through 1926-27, but owing to the larger result obtained in 1925-26 we have to consider whether we should go on to block 7 or whether we should lay up the plant, because there is no more pumping to be done in block 8. If we had gone on at the same rate as during 1924-25 it would have taken two seasons more. We have done the work earlier, and therefore a decision has to be arrived at now whether the plant in the harbour should be laid up or not. That decision has to be arrived at at once instead of two years hence. To that extent the prospects are changed.

Q.—How much land will the Military Department purchase, and at what rate? I want the latest information on the point.

A.—247 acres at Rs. 20 a sq. yd.

Q.—Does the previous understanding with them hold good ?

A.—Yes.

By the Chairman.—Is it an understanding or is it a contract ?

A.—Well, it is an agreement which was come to by representatives of the Government of India and the Government of Bombay at a conference which was held in Bombay, signed on behalf of both. The loss if the work had been stopped on 1st October 1925 would have been 533·67 lakhs.

Q.—That is, without allowing for any recoupment for the sale of the plant ?

A.—Yes, assuming the same condition.

Q.—Assuming the work is stopped immediately, what will it be now ?

A.—It would be the 533·67 lakhs with interest up to date, *plus* the expenditure from the 1st October up to the present time with interest on that amount.

Q.—Could you kindly give us the correct figure to-morrow ?

Up to what date ?

Q.—Up to 30th June last.

A.—That is, the expenditure up to 30th June last including interest ?

Q.—Give the interest separately.

A.—Yes. We shall take the same valuation for the plant in the calculation, *i.e.*, the scrap value.

Q.—What is the estimated cost per square yard of land in this neighbourhood according to your latest information ?

A.—I think that is a very difficult thing to say, for at present there is no demand for land. The Government of India have about a lakh of square yards for sale in Queen's Road, and there is no demand, so that it is very difficult to say what the value of the land is at present. I know of no recent sales in the neighbourhood of the reclamation.

Q.—Assuming you had to estimate the cost per square yard, what would you put it at ?

A.—I should be inclined to put it at the figures adopted by the Sub-Committee of the Advisory Committee, that is, an average of Rs. 50 per square yard, all over the reclamation, ranging from something like Rs. 80 in the neighbourhood of Churchgate station to probably a little over Rs. 20 in block No. 7 at the southern end of the reclamation. We are not going to sell block No. 8 to the public. The price I am mentioning of an average of Rs. 50 per square yard, is for a square yard of net building area.

Q.—Have you been measuring and checking the work done by the dredgers and also by dry filling from time to time ?

A.—Oh, yes. The Engineer checks the work done by the dredgers at the end of every season by taking sections on every ground over the filling that has been done. The dry filling that has been done by trains is measured in the wagons. The only other dry filling that is done is by lorries in Curchgate station, and that is measured by checkers at the site and check measurements are taken occasionally over the whole of the filling.

Q.—But when you have completed the filling the result at the end of the year has been very low as compared with 1921-23. The figure at page 3 of your report is 528,000. The next figure is 680,000 ?

A.—680,000 is the figure arrived at by actual survey of the area.

Q.—Have you no better means of measurement from day to day ? Have you not checked what the dredger would perform daily and taken an average ? Would it not be a gamble if you did it once a season ?

A.—I do not know whether it would be possible to take the output of the dredger every day. Measurements are made and soundings are taken every day, but it is not possible to measure the actual filling in the reclaimed area every day, for that is all under water. You have to wait until the end of the season and allow it to dry sufficiently for the surveyors to go and take the sections over it.

Q.—Did you not take out a certain quantity of liquid mud and dry it and see what the result is for the contents of each block?

A.—The Neilson Committee have done that.

Q.—That is in order to try and get some figure for shrinkage?

A.—They agreed that this figure of 2,264,000 was the actual measurement in June. Their own surveyors checked the sections, and they checked the quantities as computed from the sections, and they agreed that 2,264,000 was the measurement in June. They wanted to find out what would be a reasonable allowance for shrinkage, for on that allowance depends the calculation of what filling remains to go in. We have always assumed 20 per cent. Mr. Neilson's Committee have assumed 40 per cent. and our Engineers think 40 per cent. is a very liberal allowance, but we are not in a position to say that it is excessive, because we have no actual experience.

Q.—Have you taken any observations for silting?

A.—Oh, yes, we have.

Q.—Have you any surprise in store for us in the shape of quantities added without any effort on your part?

A.—I think the Block 2 originally was shown to measure 7 lakhs of brass on that sketch.

Q.—Twenty-six lakhs filling required for block 2?

A.—That is cubic yards. I think it was very nearly 7 lakhs of brass, and that was when it was measured originally in 1920 or early in 1921. That was the measurement then. It was measured again last February for purposes of calling for tenders for dry filling in block 2, and the measurement then was a little over 5½ lakhs of brass. The difference between 7 lakhs and 5½ lakhs being a lakh and a half in about five or six years.

Q.—Did you carry on observations from week to week to watch the silting, or from month to month?

A.—We have done it monthly after the monsoon. They have sections marked on the wall and on the shore and then levels taken over then and they are compared with the actual levels as they were before the work was started.

Q.—You have said that some of the filling has gone back to the sea through the foundations of the sea wall?

A.—Yes.

Q.—When did you notice the loss?

A.—A month after the dredging started, in January 1924.

Q.—When did you take steps to stop the loss?

A.—We brought it to the notice of Sir George Buchanan at once and he was asked if he would care to have steps being taken to stop the wastage. But he did not consider it necessary or advisable to take any steps at that time. It was brought to his notice again, but nothing was done until early in 1925 after Sir George Buchanan left here. I in consultation with the Chief Engineer decided that we should not allow this loss to continue for another season—that was the season 1925-26, and I put up a proposal to Government that we should seal the wall with moorum and that was agreed to and the work was done and completed by September 1925.

Q.—Is it mentioned in any of the published reports of yours?

A.—I do not think so. My published reports were merely reports on the progress of the work as an engineering work.

Q.—But the quantity of wastage seems to be very considerable?

A.—It is.

Q.—From 1 million to 680,000, nearly half has gone?

A.—Yes, that is so.

Q.—Could not that have been prevented earlier?

A.—It could have been prevented. But opinion was divided as to whether retention of that silt was advisable. Sir Alexander Gibb was of opinion that the silt would make very bad filling for purposes of reclamation.

Q.—Do you happen to know why?

A.—He thought it was very soft and would remain wet probably for a very long time and possibly the lower part of it might never dry at all. My impression is that Sir George Buchanan also thought that it would make inferior filling to the clay which remained behind. Clay would certainly make very much better filling which would dry almost immediately.

Q.—And the fear was that this would not dry?

A.—We have the experience of Mazgaon-Sewri reclamation.

Q.—If it remains wet at the bottom 15 feet below the surface, what does it matter?

A.—I personally do not think it very much matters. I know that was the opinion of Sir Alexander Gibb. He stated it in his report.

Q.—Would you kindly describe the organisation and the disposition of the staff employed on the works? Into how many sections was the work divided?

A.—It was first of all divided into three sections under the Chief Engineer: there

was the quarry section at Kandivli and the Marine Lines section which was dealing with the construction of the wall at Marine Lines end and the Colaba section dealing with the Colaba wall. At a later stage a dredging section had to be organised to take over the work of dredging and at that time the Marine Lines section and the Quarry section were amalgamated, so that there still remain only three sections. At the present moment we have reduced it to two sections only: the dredging section and one section looks after Marine Lines, Colaba and the quarry.

Q.—Is it for the monsoon period only?

A.—It is because we stopped the progress of the wall, and the quarry is now supplying no stone. It is only supplying moorum. Except for a certain amount of work on the storm-water drains, work is practically confined to dredging.

Q.—Do you do any dry filling now?

A.—We are.

Q.—At what rate?

A.—Two trains a day.

Q.—How many cubic feet?

A.—A thousand tons each train, and allowing for 250 days in the year, that amounts to about 4 lakhs of cubic yards a year.

Q.—Do you prepare a monthly progress report, a clear statement showing quantities and costs against each item of the estimate from month to month?

A.—No, not from month to month.

Q.—You don't prepare any progress report?

A.—There is a weekly report of the dredging showing the amount of material dredged, the length of the pipe lines, the depth that the dredger is working and so on, but the cost is worked out at the end of the season.

Q.—Not an estimate of the quantity of work done?

A.—Yes. There is a report every week. That is the quantity as measured by the soundings in the harbour.

Q.—You cannot infer from the measurements you take what the actual quantity is?

A.—We shall be able to in future. If we pump it into a compartment that is water tight, we shall then be able to assume that we can retain everything that we excavate from the harbour as ascertained by soundings.

Q.—Do you maintain daily cost sheets of entire expenditure of the work?

A.—The Chief Engineer does.

Q.—Perhaps you can get a sample of the sheet?

A.—But that won't give the cost per day of the actual dredging, because the cost of dredging is for whole year. We have to take the cost of the repairs every year after the season, and the pipe lines and there is a good deal of expenditure during the monsoon in Back Bay and maintenance of the plant and all that expenditure has to be allocated against the number of hours that the dredger works in the working season.

Q.—Could you not separate the special repairs from the ordinary maintenance of work?

A.—We have not done so, so far. We had no special repairs. There has been ordinary annual reconditioning of the plant and that is a sort of obligation that we have to incur and we charge that against the dredging.

Q.—What progress reports do you submit to Government and the Accounts Department of Government, in what form and at what intervals? We want to understand the organisation and the working. One of the terms of reference is the conduct of operations?

A.—The Accounts Officer keeps a record of the expenditure.

Q.—But the officers in charge ought to know how the expenditure is progressing with reference to the output?

A.—They know that.

Q.—I want to know what records you keep in that respect?

A.—It is kept in a register of works. I will take a note.

Q.—You ought to know the progress?

A.—Yes.

Q.—Also a list of reports and returns you render to Government?

Q.—On which sanctioned estimate are the works being carried on at present; what is the amount of the estimate?

A.—702·43 lakhs.

Q.—That estimate was sanctioned in October 1922 I take it?

A.—In October 1922.

Q.—A Sub-Committee's report mentions another estimate for 11 crores. Where does that come in?

A.—That is an estimate prepared for the Sub-Committee. It is an approximate estimate only prepared by the Chief Engineer in July 1925 to show what the probable

cost of completing the reclamation would be, assuming that the results of dredging would be no better than they were in the season 1924-25.

Q.—Now that the results are better, have you made a revised estimate?

A.—No. We only got the results on Saturday. We have got the Chief Engineer's figure, but Government had agreed that before we made out any fresh estimate, the Chief Engnieer's estimate should be checked by Neilson's Committee, and so what we want to get from them is the figures that they agree to for the annual output and unit cost of the dredging. We have got that and we can now revise these estimates, but it takes a little time to do so.

Q.—On what date did you prepare the present estimate of cost (appendix page 11 of your report)?

A.—That is the same estimate as the 11 crore estimate.

Q.—I suppose you add interest charges?

A.—It excludes certain items which depend on the length of time that the work will take. That is establishment charges and annual repairs. They brought the total estimate to about 11 crores. The actual figure is 927·34, and establishment charges at 7½ per cent. would be 101 lakhs, and then there are repairs and maintenance which have been about a lakh and a half a year. But in the case of this 11 crore estimate, as the work was going to extend up to 1944-45, provision had to be made for renewal of the whole of the floating pipe lines twice.

Q.—That you consider is not necessary now. I mean this estimate is excessive?

A.—Now it is, on the results of the last season.

Q.—Could you not give us an estimate of your own under present conditions?

A.—We are going to do so.

Q.—We want it before we wind up here?

A.—I think it possible, but it is a very big business. And Government specially wish that the estimate when made out in revision of those estimates in the Advisory Committee's report should be based on figures approved by the Engineer's Committee. Until we get their report our figures will be of no use.

Q.—You have got the figures now. How soon do you think you can give us?

A.—The Chief Engineer thinks that he could give an approximate figure within a fortnight.

Sir Frederick Hopkinson.—Would you not prefer the estimates of your own engineers who are thoroughly experienced—I would myself?

A.—My position is that the Government have appointed this Committee of Engineers to check these figures.

Q.—We will also study theirs separately. Government surely will have no objection to your giving us your own estimate?

A.—The Chief Engineer only received the report of the Engineers' Committee yesterday morning and he has not had time to go through it, and he is not in a position to say whether if he was asked to give an estimate himself disregarding the report of the Engineers' Committee he would adopt their figures or whether he would adopt different ones. He has not had time to consider it.

Chairman.—As I understand it, we have got a report handed to us a few moments ago, which gives us certain figures. They express the view of a committee that has been sitting. The Chief Engineer might be able to get out an approximate set of figures independently of that committee. That is, an approximate set of figures derived from his own experience. Would that be a difficult matter?

A.—It could be done in a fortnight. That would be the Chief Engineer's own view of the ultimate cost.

Q.—Is that it?

A.—That would be so.

Q.—We can then consider that in conjunction with the report of the Committee?

A.—The report of the Committee only refers to blocks 1 and 7. The total filling required in block 1 is 496,189 brass or 1,836,740 cubic yards. 1,837,000 cubic yards is the total quantity required. The amount deposited up to the 21st of June 1926 is 155,987 brass.

Q.—How much will that be in cubic yards?

A.—About 577,700. That is the quantity remaining to be done.

Sir Frederick Hopkinson.—That is, a million and a quarter still required?

A.—Yes.

Sir M. Visvesvaraya.—How much in block 8?

A.—The total estimated quantity is 3,909,544 cubic yards.

Sir Frederick Hopkinson.—How much is done?

A.—Up to 31st May 1926, dredged filling amounted to 762,493, that is, after allowing shrinkage.

Q.—You have taken the same percentage in the case of block 1 also?
A.—Yes. Dry filling has also been deposited in block 8.

Q.—Kindly give us roughly now the quantity remaining to be done in block 8 and block 1?

A.—The amount of dry filling is 351,693 cubic yards. The total amount of filling of both kinds deposited in block 8 is 3,114,186. That leaves us still remaining on the 31st May last 795,358 cubic yards in block 8.

Q.—In block 1, 577,700?
A.—Yes.

Q.—The total is about a million and a quarter cubic yards?
A.—Taking blocks 1 and 8 together, but these figures are not up-to-date. They are up to May in the case of block 8.

Sir M. Visvesvaraya.—What is the estimated cost of completing blocks 1 and 8? I want rough figures.

Sir Lawless Hepper.—I can give it as regards block 1. According to the estimate of the Engineers' Committee, it is about 16 lakhs.

Q.—What about block 8?
A.—I have not got the figures.

Q.—Can you make a rough estimate without committing yourself?
A.—It would be somewhere in the neighbourhood of 28 lakhs.

Q.—Roughly the total will be 44 lakhs?
A.—Yes. I have got here one of the monthly statements of accounts. It is sent every month by the Accounts Officer to the Chief Engineer.

Q.—The work remaining in blocks 1 and 8 is estimated to cost 44 lakhs. I suppose you want some time to allow the stuff to settle and you will not be able to complete it at once?
A.—The reclamation would take 2 seasons. We estimate that block 8 will be completed by March 1928.

Q.—And block 1?
A.—It will also be completed about the same time.

Q.—Have you any idea of the total cost of the work up to the time these two blocks will have been completed?
A.—You want the cost including interest.

Q.—No, excluding interest.
A.—I do not know the cost up to date. I think it is given in the statement I have supplied.

Up to 30th June 1926 the total expenditure works out to 421·23 lakhs and including interest and general charges, establishments and suspense, it comes to 590·91 lakhs.

Q.—So, roughly you can tell us what the total cost will be by the time the two blocks are completed. Of course you will have to add to it 44 lakhs and there would be expenditure from the 1st July until the commencement of the work during the season?
A.—Most of the expenditure will be included in the 44 lakhs.

Q.—Do you propose to go on with No. 2 and No. 7 simultaneously?
A.—No decision has been arrived so far.

Q.—You will have reclaimed about 15 lakhs sq. yards.
A.—We shall be due a credit of 239 lakhs from the Government of India.

Q.—You will then be about 4 crores to the bad?
A.—Yes, against 533 lakhs.

Q.—I understand that if you are allowed to proceed with other blocks you will take up No. 7 first and No. 2 afterwards?
A.—I think No. 2 and No. 7 together; that is my personal opinion.

Q.—You said yesterday that Sir George Buchanan was not a member of the firm of Meik and Buchanan until the latter took up the Bombay Back Bay Scheme?
A.—I think he was not until after the Government of Bombay asked him to report. Mr. Meik was a member of the firm and had his office in England. There were two engineers who were members of the firm, I believe.

Q.—When did Mr. Lewis retire?
A.—On 1st July 1924.

Q.—Why did he leave the work?
A.—He retired under the 55 years rule. He was an officer of the Public Works Department.

Q.—Could you give us some rough figures to show what it is costing you now per cubic yard or per brass to obtain moorum filling?

A.—I can only give it per brass. The figure which the Committee of Engineers have arrived at for consolidated moorum filling by train is Rs. 5·79 per brass.

Q.—And dry filling?

A.—Moorum and dry filling are the same.

Q.—What would be the rate for filling it by dredger?

A.—By working at the rate which the Engineers' Committee have adopted, it comes to 11·88 annas per cubic yard.

Chairman.—Let us change the price 5·79 per brass into cubic yards.

A.—It comes to Rs. 1·56 per cubic yard.

Sir M. Visvesvaraya.—The corresponding rate for filling with dredger?

A.—Rs. 0·75 per cubic yard. It is on the report of the Engineers' Committee who assumed shrinkage at 40 per cent.

Q.—Is this figure 0·75 per cubic yard for dredging from the Back Bay or from the harbour?

A.—From the harbour.

Q.—What would it be for the Back Bay?

A.—The figure given by the Engineers' Committee for the dredging is 1·3 per cubic yard.

Q.—Why has the cost of dredging risen from Rs. 0·75 to Rs. 1·3?

A.—The cost of dredging in the Back Bay has always been higher.

Q. Do you think these rates which are now given are satisfactory for framing future estimates for filling the remaining blocks or do you think that by further experience you will be able to lower the rates?

A.—The idea was as recommended by the Advisory Committee to revise these rates every year in the light of the experience gained during the previous season but as far as we can see these figures are being adopted by the Engineers' Committee. They seem to be quite safe and rather on the safe side because they allow considerably more shrinkage than our engineers ever thought it necessary to adopt.

Sir F. Hopkinson.—In other words you approve these?

A.—I think that on the experience of past years, they are very safe.

Sir M. Visvesvaraya.—It will run up the cost of reclamation?

A.—It will, but it is very much less than the figure on which the Advisory Committee based their statement; that is 19 annas per cubic yard.

Q.—I may be mistaken but I understand that it is stated somewhere that in the harbour there was three times as much material as you wanted for the reclamation.

Sir F. Hopkinson.—That is stated in Mr. Kidd's Report.

A.—You are getting 15 million.

Sir M. Visvesvaraya.—What becomes of the remainder?

A.—You are losing the remainder out of that particular area but Mr. Lewis suggested that we could obtain the balance of the material by going further out in the harbour. But it would have meant a much longer pipe line and possibly another intermediate pumping station to obtain the material. The difficulty is whether it could be got at all and it was therefore decided to get it in the Back Bay in preference to going out further into the harbour.

Q.—You think it is cheaper?

A.—I am not sure.

Q.—Would it not be wise to go into the question?

A.—It will have to be investigated.

Sir F. Hopkinson.—The figure which has just been arrived at—I am referring to 0·75 per cubic yard—does it cover superintending charges or it is only working cost?

Sir M. Visvesvaraya.—What overhead charges are included in it?

Sir F. Hopkinson.—I personally want to see how the figure is arrived at?

A.—The figure is based on the total working expenditure of the whole 12 months and then establishment charges at the rate of 13½ per cent. are added to it.

Chairman.—Is the Report of the Committee of Engineers signed?

A.—Yes, this is a copy of the Report.

Q.—You approve of it?

A.—I have only read it through once. The only thing that struck me was that they have made a very large allowance for shrinkage.

Sir F. Hopkinson.—The cost of the dredger is the most important factor in an enquiry?

A.—This Committee has discussed the question of cost with the Chief Engineer and our Accounts Officer and they are all agreed as to the actual cost for the whole year including repairs, overhead charges and expenditure of all kinds.

Chairman.—Mr. Neilson is the proper person to speak about it and not yourself.

A.—Yes.

Sir M. Visvesvaraya.—Can you give us in advance a complete estimate of the cost of the whole scheme?

A.—The estimates are framed for us. I am still in doubt whether it should be based on the figures of the Engineers Committee.

Q.—We want your own figures as well as those based on the Committee's figures.

Chairman.—If you can furnish us approximate figures within 14 days, those can be compared with the estimate of the Committee; that would be sufficient for this Committee.

A.—The question is whether we ought to work on two different sets of figures. The Committee appointed by the Government of India want us to prepare figures on our own estimates and we are also required to prepare estimates on the figures arrived at by the Engineers Committee and it would be most awkward to advise the Government of Bombay on the adoption of those figures when the figures prepared for you will be quite different.

Sir F. Hopkinson.—What is your experience?

A.—I am pointing out the difficulty.

Q.—You are the Chairman of the Development Directorate and with the assistance of your engineering staff you might be able to advise us what the work is ultimately going to cost if completed as a whole or in part. I understand there will be no difficulty in your furnishing us with an approximate estimate within 14 days?

Chairman.—Therefore we should have the Committee's figures on the one hand and the Development Directorate's on the other.

A.—The results would not compare.

Sir F. Hopkinson.—We should be able to compare as regards blocks 1 and 8.

A.—Not unless we show figures for each block separately which is difficult.

Q.—Why not? You have got experience from year to year of the rates arrived at and from these you could deduce what rates should be put in including overhead charges?

A.—I can prepare a works estimate of the total cost of the scheme for comparison with the sanctioned project estimate of 702 lakhs.

Q.—We are asked to recommend what should be done in future and unless we know what the works are likely to cost, we cannot possibly make any recommendation.

A.—The cost is very much complicated by the interest charges.

Sir F. Hopkinson.—The interest charges are bound to accrue. As far as we are concerned leave the interest charges, that can be separately calculated.

A.—We can give you estimates for the whole scheme within a fortnight.

Sir M. Visvesvaraya.—Could you also give an alternative estimate taking into account the rates given by the Neilson Committee?

A.—I do not think the Neilson Committee are prepared to agree that these rates should be taken for the completion of the whole scheme. They are to advise Government what may reasonably be taken for completing blocks 1 and 7.

Q.—You can use their figures as you think proper. In addition to that could you also take their rates into consideration?

A.—We shall take into consideration their rates in framing our own rates.

Chairman.—Let me explain what we really want. What we want is a document of a definite character from the Development Directorate dealing with the amount which they estimate it will cost to finish the work and a document which can be held up later on by the Development Directorate as being a most excellent prophesy or it may be held up against the Development Directorate as having been an entirely mistaken document as regards the figures of cost. We want a document which for good or bad is the considered opinion of the Development Directorate. They have had experience of years of the scheme. Can we have it?—We can do it in a fortnight.

Sir M. Visvesvaraya.—At one time 15 hours working in two shifts was considered possible. Why did you find it impossible?

A.—We found in practice that it was not possible.

Q.—In the fair season?

A.—In the fair season there are two shifts of 8 hours each, and out of that we find by experience that we cannot do 15 hours of actual pumping. It averages in practice about 12 hours.

Q.—Could you not have 3 shifts of 8 hours each?

A.—They work from 6 in the morning till mid-night. I don't know if we can get men to work longer shifts than 8 hours.

Q.—I suppose a third shift is not possible if you organise it?

A.—You cannot run the dredger for 24 hours week after week. There may be repairs.

Q.—You may stop it at intervals and work on in three shifts. There are factories in India working with three shifts of 8 hours each?

A.—I think there would be very great difficulty about it. I don't know whether we shall be able to get the staff to do it. To begin with, we will have to arrange that the whole of the staff employed live on shore. At present they live on the dredger, and six hours from mid-night till 6 in the morning is the only time when anybody can sleep.

Q.—There are people living near factories which do this?

A.—That is a different thing.

Q.—Could you not try to have three shifts; the overhead charges would be considerably reduced thereby?

A.—The Chief Engineer tells me that he is going into it with the Deputy Chief Engineer.

Q.—The interest charges of the plant would be saved?

A.—Oh certainly.

Q.—What was the original estimate for the sea wall prepared by Sir George Buchanan, roughly?

A.—118·11 lakhs.

Q.—What was your estimate? I understand you have the latest estimate. I want these three figures separately?

A.—106·85 lakhs is the sanctioned project estimate.

Q.—At present what is your estimate, 53 lakhs?

A.—No, it is the sum of the first 3 items on page 11 of my statement. It is 101·85 and the figure now is 78·81. 101 is our sanctioned project estimate, but the cost as anticipated now is 78·81.

Q.—Was that due to any specifications of the work?

A.—It was due mostly to reduction in the concrete wall on the top of the rubble mound. At Colaba it was reduced in width from 16 feet to 12 and at Marine Lines it remained 16 feet, but the blocks which were originally designed solid were made hollow. Twenty-ton concrete blocks were originally provided to come on the outside as protection. It was decided not to use them but to use large blocks of stones from the quarry and that produced a certain amount of economy.

Q. —I take it that Sir George Buchanan first approved of the revised estimate of 702 lakhs?

A.—Well, it was not sent to him, as a matter of fact. The Accountant General was pressing for the detailed project estimate and it had to be submitted without Sir George Buchanan's firm seeing it.

Chairman.—Does Sir George Buchanan's statement violently dissent from the 702 estimate. He says it was extravagant?

A.—Yes. We sent it to him afterwards, and he protested against it very strongly. Then a subsequent estimate was prepared, and that estimate was sent to him.

Q.—What did it come to?

A.—There have altogether been 6 estimates. The first estimate of Sir George Buchanan was 367·61. Then Sir George Buchanan himself submitted a revised estimate for 598·89 lakhs in February 1922. As submitted, it was actually 498 lakhs, but before he left Bombay he put it up by a crore. The next one was the detailed project estimate for 702·43. Then as a result of the decision to dredge in Back Bay a revised estimate was prepared by Mr. Lewis for 726·54 in July 1924. That was further revised again by Mr. Elgee in January 1925, his figure being 712·79 lakhs. The last one of all is 1109·43 which is based on the results of the dredging in 1924-25.

Q.—Who is responsible for that?

A.—The Acting Chief Engineer Mr. O'Rorke. That is not a detailed estimate. That is an approximate estimate prepared for the Advisory Committee.

Q.—For purposes of accounts, you are going on the 702 lakhs?

A.—Yes.

Q.—Could you kindly give us a comparative statement according to 702 estimate and also the actual expenditure up to 30th June 1926?

A.—I think it can be given in the form of Appendix A to my statement. If you want it in detail I can get it from the Accounts Officer, but some of the sub-heads are large.

Q.—We want general abstracts for each of these big figures?

A.—Have you seen the sanctioned project estimate. It was submitted by the Chief Engineer in May 1922 and sanctioned in October 1922.

Q.—Will your office give us a general abstract for each figure? We can't understand the details at all, because many of the figures are in crores and lakhs?

A.—Could you give me an item.

Q.—For example roads and lights Rs. 119·96 lakhs ?

A.—No work will be started for several years. The details are given in page 18. There has been no expenditure incurred on that head.

Q.—Of items on which you have operated could you give us abstract estimates ?

A.—I should like to ask the Accounts Officer. I shall do what I can.

Sir Frederick Hopkinson.—Could you please give us not only the lump sum but the quantities and rates and how it is arrived at ?

A.—This is a question of expenditure.

Sir M. Visvesvaraya.—Was Sir George Buchanan's estimate described as approximate when Government applied for the Secretary of State's sanction ?

A.—It was an estimate. Government said they were prepared to make some addition on account of the increased cost of prices.

Q.—But it was not described as approximate ?

A.—No.

Q.—The detailed estimates were prepared after the sanction of the Secretary of State was received ?

A.—The Secretary of State's sanction was in May 1920 and the detailed project estimate was called for in December 1920 soon after the Directorate was formed.

Q.—You say as a reason for preparing the detailed estimates and for increase of expenditure by about 3 crores, the prices of machinery, labour, fuel, etc., went up ?

A.—Yes.

Q.—Have not the prices gone down since and have you made any allowance for this in your revised estimate ?

A.—The main cause was the cost of the plant which we bought.

Q.—The cost has gone down now ?

A.—But that does not help us.

Q.—Could you not reduce your working charges ? The price of fuel has gone down ?

A.—We are using oil fuel. There has been a slight reduction.

Q.—Will you kindly give us with reference to the dredger plant in a tabular form the following information :—

The initial cost of each plant up to the date of erection and up to the date on which operation began. (The witness handed over a book.)

Q.—The hours of working in each area ?

A.—Is not that a sufficient statement that I have already given.

Q.—Could you give us information about the working of this dredger plant, the time in each year, the period of working, the cost of work done each year ? We want to know the rate at which work was done in each year ?

A.—We can give that.

Sir F. Hopkinson.—Sir Lawless, have you been Director of Development since the inception of the Back Bay Scheme ?

A.—Since the 8th November 1920.

Q.—And as such I presume you were solely in charge of the Back Bay Reclamation from that date ?

A.—The Back Bay Reclamation was one of the schemes that came under me, but I was not in charge of it from the technical point of view.

Q.—No, you had the general charge of the whole scheme. You were entirely responsible ?

A.—It came under me.

Q.—Therefore you are entirely responsible for the scheme as Director ?

A.—I am not in any way responsible for the technical details of the scheme.

Q.—For the design or the carrying out ?

A.—No, I am not responsible.

Q.—Who is ?

A.—Sir George Buchanan was.

Q.—And who is since he left ?

A.—Nothing has been said about that.

Q.—Do you mean there is no one in sole charge of the whole scheme ?

A.—I suppose now that his agreement has been terminated, in the absence of any other orders from Government, I take it I am in charge.

Q.—I thought as Director you would have been responsible from the beginning ?

A.—Not for the technical part of it.

Q.—In the report of the working of the Development Department for the period ending 31st March 1921 one of the duties of the Department is said to be to carry out the Back Bay Reclamation Scheme and any other reclamation scheme ?

A.—Yes.

Q.—Surely as Director then, you are responsible?

A.—I have always assumed that for the technical details Messrs. Meik and Buchanan have been the responsible Engineers.

Q.—Being in general charge of the whole thing you are responsible?

A.—My duties in connection with it are of an administrative character.

Q.—They are purely the Engineers. You have the sole responsibility. They act under your instructions?

A.—No, not in technical matters. I have never considered I am competent to give them instructions in technical matters.

Q.—But they sent their reports to you?

A.—Yes, every time Sir George Buchanan came out he made reports to the Government.

Q.—To you or to Government?

Sir M. Visvesvaraya.—It is all addressed to you?

A.—Yes, I think it is addressed to me, but I have never assumed that I was in a position to dictate to them in any way as regards engineering technicalities.

Q.—I understand, but with regard to the general scheme you would be associated with it almost daily, and you would know everybody, and if the Engineer asked your advice or instruction you would give it?

A.—The agreement is that the Chief Engineer is to carry out the work under their instructions.

Q.—Will you tell me how long Sir George Buchanan was actually out here during the progress of the works?

A.—He was out here on the average I should think, something like 5 weeks a year, except in one year when he came out in the monsoon. I would prefer to give the exact dates. There was one year when he stayed rather long, and some of his visits were rather short.

Q.—The working period is about 7 months?

A.—About that.

Q.—He was here about 15 per cent. of the working time, 5 weeks out of 30?

A.—Yes, something like that.

(*Chairman.*—I will tell you. He arrived in November 1920 and stayed till February 1921.)

Q.—I am not particular about the exact dates but what I wish to show is that he was here such a short time and that therefore there would be someone else who would have to take general control and direction of the works, and that, I presume, would be you?

A.—The Chief Engineer was to carry out the works under their instructions, and they had to send to Meik and Buchanan complete reports weekly showing exactly what was being done, and they had to take their instructions in any case where they wanted to.

Q.—Would not those go to you?

A.—Correspondence between the Chief Engineer and Meik and Buchanan was addressed through the Director.

Q.—Therefore you being here the whole time you would be in constant touch with every phase?

A.—I knew what was going on.

Q.—Therefore we come back to what I said before that you are in fact responsible for the whole carrying out of the work, particularly as Director?

A.—Yes, subject to Meik and Buchanan being the responsible Engineers.

Q.—As Director and having been so long associated with the scheme, and the Government being dubious about what they ought to do, will you say what you would recommend the Government to do as regards the whole scheme?

A.—I should advise them to go on and finish it.

Q.—At any cost?

A.—I think so.

Q.—Have you so advised them?

A.—No.

Q.—Have you told them what it is going to cost them?

A.—No, I have not got that figure yet.

Q.—Then it is hardly a commercial way of putting it to say you would advise them to go on without knowing what it is going to cost them and what they would get for it?

A.—Having gone so far and spent so much money I believe it would be better to complete it, the main reason being that you can build the marine drive right round, which would make a feature on the land and make it more attractive. In making proposals for partial completion it has always seemed to me you would lose the advantage of the amenities, and the land would not have the same value as it would have if the complete scheme is finished.

Q.—It is understood that we are to have from you in a fortnight a detailed estimate as to quantities, unit prices and totals of the whole cost of completing the scheme?

A.—I think we shall give an approximate cost.

Q.—Surely after three years' experience you can give us exact figures?

A.—It depends on the Chief Engineer. Do you want the figures for the roads, etc.

Q.—Everything.

A.—We shall certainly do our best.

Q.—You see the position of the Committee. We are asked to advise the Government what to do in the future. It is impossible for us to advise the Government unless we can see what it is going to cost.

A.—Yes.

Q.—Therefore it is essential for this enquiry that we should have the closest possible estimate that can be made, based upon past experience, of what you expect the work will cost in the future. You had three years or more to find out the values of all the works in the reclamation, and I imagine you can tell within a small figure how much it will be?

A.—I think we ought to be able to give a pretty close estimate.

Q.—How close you mean, 5 per cent., 10 per cent., 20 per cent.?

A.—A variable factor is the dredging.

By Sir M. Visvesvaraya.—You know so much more about dredging than we can possibly know. We want the best information you can give us. You and your assistants ought to be in a position after three years' experience to tell us what the dredging would really come to?

Sir F. Hopkinson.—Within what margin do you think you can give us?

A.—10 per cent. I think.

Q.—That is a very wide margin surely after three years of experience.

A.—The dredging figures have varied very considerably during these three years.

Q.—Surely after three years' experience you have nothing to learn about the dredging in Bombay?

A.—It depends on what the shrinkage is going to be.

Q.—If you can give an estimate as to what the dredging will cost, the shrinkage is a minor affair?

A.—I can do so. Last season there has been an increase of bulk by 20 per cent.

Q.—Is that consequent on the year's work or some difference in levels, or mistake in previous figures?

A.—It is the year's work.

Q.—Clay does not shrink?

A.—Clay does not, but silt does.

Q.—What proportion of silt is there?

A.—It is probably in the neighbourhood of 60 per cent.

Q.—Is this silt so impalpable that it runs like water?

A.—A considerable quantity of it simply goes away with water. It looks like dirty water.

Q.—If it is pumped and enclosed, it cannot go away, except the overflow?

A.—We arranged the overflow at a high level and the result was we had a large lagoon and we were pumping into it at one end. The overflow was on a high level at a point remote from the discharge, and the water passing over the weir was perfectly clean until towards the end of the season when the silt which was being deposited gradually rose up and finally came nearly up to the level of the water, and then it was impossible to prevent a certain quantity of the silt going over the weir. Practically the whole of the silt has been retained this year.

Q.—And in previous years it has not been the case?

A.—No.

Q.—Do you think that accounts for your increase of 20 per cent.?

A.—We think that that is what is due to.

Sir F. Hopkinson.—The silt is the material we saw the other day. Will that ever solidify?

A.—The only example I know of is the Mazagon-Sewri reclamation which is reclaimed mainly with silt. And it is now covered with roads and railway sidings, the whole of the cotton trade has been removed there and quite large and important buildings have been built on it. There is a very large area of sheds for dealing with grain and seeds, the whole of the rail borne coal traffic of Bombay is dealt with on it, and the G. I. P. Railway have a large store yard on it. It is true there was a good deal of trouble at the commencement, but I believe the difficulty is getting less, although I am told that if you stand by the side of the road and a heavy lorry is passing you can feel the ground shake, and one or two of the cotton stations have cracked owing to the vibration caused by the trains; but there is no difficulty in maintaining the railways and sidings or the roads on it, and there is no doubt that the reclamation has been an extremely valuable addition.

Q.—Was that Sewri reclamation pumped into an enclosed lagoon, or was there a rubble wall?

A.—I think, into an enclosed lagoon.

Q.—How do you account for the loss of 24½ per cent.?

A.—I find it very difficult to account for it. Mr. Neilson would be in a better position to explain that.

Q.—It seems an extraordinary amount to lose?

A.—There must have been an overflow of some sort. As the water was being pumped in it must have gone away somehow.

Q.—Have you got with you sections of the dredging in the harbour?

A.—I have not got it now.

(I shall want those and the same in Back Bay showing the top level of the mud and the surface level of the clay, and how far you have dredged into the clay.)

A.—The difficulty about Sewri was there was a soft bottom beforehand. The foreshore consisted of very considerable depth, about 30 or 40 feet of mud and the reclamation was put on the top of that. In the case of Back Bay there is hard bottom and clay and rock everywhere, so that the foundations would not be very deep and you would get good bottom.

Q.—I think you said this morning that the earliest date No. 8 block would be ready is the middle of March 1928?

A.—Yes.

Q.—That is the earliest date the Government could reckon upon that portion of the reclamation?

A.—There has been a suggestion we might be able to transfer parts of it if we could get them ready before, and if we do not require them for our own purposes and if they would be of any use to the Government of India, it will go to reduce the ultimate cost of it.

Q.—Of course as soon as it is ready it will produce results in the way of payment. But about block 1, when do you think it would be ready?

A.—Probably about the same date or a few months later in 1928.

Q.—If I remember rightly the land which will make up block one will be recreation ground?

A.—That was so according to the provisional lay-out plan. But it is very doubtful whether the Government will be able to allot such a large area as recreation ground, and the Consulting Surveyor to Government is at present preparing a lay-out plan for that block based on the assumption that the recreation ground would be smaller and the whole of the frontages facing the marine drive would be sold, and also a certain amount of land round about Churchgate Station would be available to be productive.

Sir F. Hopkinson.—Have you noticed in the previous year that you had silt in block 8 of the consistency we saw day before yesterday when the man waded into it?

A.—We had a small quantity.

Q.—Did that solidify?

A.—It did. It shrinks for a certain time, then it contracts laterally, and fissures appear.

Q.—That is only near the surface?

A.—No, they go down. It did become solid as far as one could see.

Q.—And broke up under the sun?

A.—Yes.

Q.—If you cover that with moorum then it won't crack?

A.—No.

Q.—Can you tell me the present working season's cost per cubic yard of the dredging in the Back Bay and the Harbour?

A.—I am working at them. The only figures we have got is the figure in the report of the Engineers' Committee.

Q.—I am asking you as representing the Back Bay Reclamation. They only know what you tell. I want the answer from your Department, not what somebody else thinks about it.

A.—I would like to send it to you in separately.

Q.—In this estimate you are going to give us I want you if possible to keep each block separate, because it may be that we shall report on certain blocks being finished and certain blocks not being finished. The wall does not matter, because it is to all intents and purposes finished, and we have got your estimate.

A.—We can give that information in blocks.

Q.—Have you seen the particulars of the tests of the dredger Lloyd?

A.—Yes.

Q.—If I remember right the dredger was supposed to have dredged 3,700 cubic yards of clay in an hour. Is that so?

A.—Without pipeline it is reported to have done so. It is at page 31 of the printed correspondence.

Q.—When did you first see the results of those trials?

A.—We got them some time in the middle of February 1922. They came from the Director General of Stores with a letter dated 31st January 1922.

Q.—Were you satisfied with them?

A.—I discussed them with Mr. Lewis, and they seemed to us to be of a rather sketchy kind, but the dredger was practically on its way or it was just on the point of starting to Bombay. It arrived in March of the same year.

Sir Frederick Hopkinson.—It looked to me on reading the report that they were not dredging at all. They were simply pumping water. They give the various details about the working of the pumps. Was that before or after you took the soundings, so that really according to this report they were only pumping water?

A.—I think so.

Q.—The second test is referred to at page 36. On the 19th and 20th December those trials were carried out. The first was on the 24th of November to ascertain that the pumping engines were of strong enough design to pump against the equivalent discharge head required by 5,000 feet of 42" piping. They don't say here that they were doing any dredging at all?

A—No. At the same time in other places they say these measurements represent 7,402 cubic yards and then go on to say it was not possible to reproduce these circumstances entirely, but subsequent tests as recorded on page 7 were carried out with a restricted orifice to approximate the load due to discharge pipe. It does not look as if any dredging was done on the second occasion.

Sir Frederick Hopkinson.—Then there was only two hours' test?

A.—Yes, if you only raised 7,000 yards. A letter was sent to us by the Director General of Stores who said that the Naval Architects stated that the dredger fulfilled the contract in all respect and would be ready to sail in about a week.

Q.—I believe it is stated in one of these reports that your department is satisfied with the dredger as a dredger?

A.—The Chief Engineer had reported that there was nothing wrong with it as a dredger.

Q.—Will you please tell me who can give me the best opinion as to what is considered to be the failure of the dredger to do the stipulated quantity of work? Can you?

A.—I have already given my opinion which is based on the opinions of our Engineers that it is due to material. But of course either the Chief Engineer, or Mr. Brims or Mr. Speirs himself will be able to give evidence from actual experience. Mr. Speirs has not only been with us the whole time but has also been in charge of the Port Trust work during the whole time.

Q.—I believe he is in England?

A.—Yes, he is in England.

Q.—Would you call any of the clay of the harbour hard for your cutters?

A—It is very hard and heavy when you get down to the lower levels and the dredger cannot get the same amount.

Q.—Is that due to the hardness of the clay or the suction pipe?

A.—The Chief Engineer thinks it is the hardness of the clay. I have seen the pressure in the pipe rising due to the clogging, and finally something has to go and what goes is a block of clay of 42" in diameter. I have seen it myself.

Q.—That is 5,000 feet away. Doesn't that mean that the dredger has been digging too much—was digging too big a cut at one time? You only want a small percentage to make 2,000 yards per hour. It is quite a small percentage?

A.—Yes.

Q.—Therefore the pipe should not clog?

A.—The clogging occurs mainly at low tide where the floating pipe line terminates on a terminal pontoon, and then there is a long pipe which goes from the pontoon to the shore and rises and falls as the tide rises and falls, and it is apparently at low tide that the clogging occurs.

Q.—You cannot help, can you?

A.—No.

Q.—It has nothing to do with the dredger?

A.—No.

Q.—How much silt have you on the top of the clay in the harbour?

A.—The Chief Engineer says that the silt varies from 15 to 16 feet, but Mr. Brims will be able to give better information.

Q.—We leave it at that until Mr. Brims and Elgee are here?

A.—Yes.

Q.—I want you to understand that in all our estimates I am not dealing with the subject of interest at all, but plain cost?

A.—Yes.

Q.—Is it possible for us to see the working of the dredger which is undergoing annual overhaul and the various parts which have been removed? I cabled out three weeks ago that I would like to see?

A.—The Chief Engineer reported that he could not see how it would be possible.

Q.—Will you just tell me now what stage the various dredgers are in? "Sir George Lloyd" is undergoing overhaul and will be ready to work when?

A.—About the middle of September.

Q.—And the "Colaba", in what state is she in?

A.—They are lifting the engines in order to complete the stiffening which we had to do to prevent the excessive vibration that set in last year.

Q.—Do you know the cause of that?

A.—There seems to be a difference of opinion about the cause. The dockyard authorities in Bombay seem to think that it was necessary to stiffen the hull of the ship but Sir John Biles, Messrs. Meik and Buchanan and Simons said that it was not that, and that the way to get over it was to operate the sea valve on the suction side of the pump. But that was not found to be effective, because it took four men 15 or 20 minutes either to open this valve or to shut it, and the changes from vacuum to pressure were momentary only.

Q.—The position of the "Colaba" is simply to pass material alone?

A.—Yes.

Q.—Is she a self-propeller?

A.—Yes.

Q.—Twin-screw engine?

A.—Yes.

Q.—Can you tell me what that is for?

A.—She came out under her own steam.

Q.—Just to come out?

A.—Yes, except to go about in the harbour.

She takes up a position in one place and remains there until the season is finished?

A.—Yes.

Q.—Are there separate engines to pump?

A.—Yes.

Q.—Her duties could be carried out by good pontoon?

A.—Quite as well.

Q.—There is no need whatever to make her a self-propelled ship?

A.—No.

Sir M. Visvesvaraya.—Could you get "Sir George Lloyd" ready for working in three weeks' time?

A.—The Chief Engineer says that she is being reconditioned.

Sir Frederick Hopkinson.—In the memorandum of Sir George Buchanan on page 21, it is stated in the report of the 7th of February 1921, "On the fullest cosideration, I am not in favour of accepting any tender. No contractor has been able to evolve a plan for carrying out the work so well or so cheaply as can be done departmentally". Have you seen that?

A.—Yes.

Q.—Did you in fact get tenders for building a wall?

A.—Tenders were called for the first 8,000 feet from Colaba.

Q.—On what date?

A.—It was I think in December 1920 or January 1921, very soon after the work started.

Q.—December 1920? Sir George Buchanan says on February 7th that he was not in favour of accepting any tender?

A.—The tenders were referred to him.

Q.—Do you know why they asked for tenders on that date? I think Sir George Buchanan recommended that tenders should be invited. In this report he discusses the way in which the work should be done. He recommended (on pages 14 and 15 of his report, paragraph 43) that the dredging should be done departmentally in any case. At the bottom of the page he says tenders should be asked for the construction of the sea wall?

A.—Yes. He proposes two alternatives.

Q.—Actually tenders were asked for in 1920?

A.—I cannot give the exact date.

Q.—I believe tenders were sent in?

A.—I think there were about six tenders.

Q.—And declined by Sir George Buchanan on February 7th?
A.—Yes.

Q.—Is it not a fact that the whole of the plant required for building the sea wall was ordered in November 1920 by your department?

A.—I think the plant that was ordered was the plant for building the wall at Marine Lines. So far as I remember, for the wall at Colaba there was very little plant required. The first 2,000 feet was built directly on the rock, but there was not at that time any special plant for building the wall at Colaba.

Q.—But the whole of the plant was all ordered in November? There was no pile driving at Colaba?
A.—It was done at the Marine Lines.

Q.—How was the concrete put in?

A.—That was put in with steel forms. They ran along rails on the top of the rubble mound and formed a block about 40 feet long leaving a gap. Finally the gaps were filled, but that plant was not ordered until long after 1921. That was at Colaba.

Q.—But surely there are piles at the Colaba end?
A.—No.

Q.—Which is the Colaba end?
A.—The block 8 end.

Q.—There are no piles there at all?
A.—No.

Q.—The concrete was pushed on the top of that rubble mound?
A.—Yes. The end lipped bank was widened out by the side lipping wagons and heavy stone put on the outside.

Q.—Have you a sketch map of that section of the wall?
A.—I think we must have.

Q.—On which progress would be entered?
A.—Yes.

Q.—I want to see the depth of the foundation of the whole wall from one end to the other?

Sir M. Visvesvaraya.—You have a longitudinal section, I think?

Sir Frederick Hopkinson.—I see that for the building of that wall your plant cost nearly £400,000?

A.—That includes the plant and the rolling stock. I have not got that.

Q.—Can you tell why the wall was built from both ends simultaneously?
A.—I think Sir George Buchanan recommended it in one of his reports.

Chairman.—On the contrary. You mean the report of Sir George Buchanan of February 1922, page 2, about the middle?

A.—I think it was discussed with Sir George Buchanan. I am sorry I was under the impression that it was his suggestion. I see I was wrong.

Q.—The paragraph reads as follows:—Under the orders of Government the construction of the new wall is being proceeded with from both ends simultaneously instead of from one end as in the original scheme involving an increased expenditure in machinery and plant. Who gave those orders?
A.—I should like to look that up.

Q.—It says "under orders" from Government?
A.—Yes, it would not have been issued by me.

Q.—It must have gone through you?
A.—Through me, yes.

Q.—And did you approve of it?
A.—I should like to refresh my memory about it from the papers.

Q.—But the Government surely did not take the initiative and say 'this must be done in this way'?

A.—My impression is that Sir George Lloyd was anxious that the work should be started at the Marine Lines end, because it was seen by everybody and from the spectacular point of view it would be perhaps good propaganda to show some work.

Sir Frederick Hopkinson.—But surely the Marine Lines is the proper end to begin?

A.—No. That was not the proper end to begin. The Colaba end is the proper end.

Q.—Block 8, isn't that the Marine Lines?
A.—No.

Q.—Colaba end was surely the proper end to begin the dredging, and therefore the wall should begin there and the dredging followed along that?
A.—Yes.

Q.—What is the good of building the wall at the other end?
A.—There was not much use.

Q.—It was simply to give a spectacular display for purposes of propaganda ?
A.—I have said I would like to refresh my memory from the papers of my office. So far as my memory goes, it was something of the kind.

Q.—According to your own project estimate, the wall at the Colaba end could not possibly have been wanted until about 1928-29 ?
A.—Colaba ?

Q.—The Marine Lines ?
A.—Yes.

Q.—And therefore the construction of the whole of that wall beyond block 8 must have been paying interest ever since it has been built ?
A.—That is so.

Q.—Will you agree with me that the proper way to do that would have been just to have kept it at a reasonable distance in advance of the dredging beginning from block ?
A.—Yes.

Q.—And that all the work done at the other end has been quite useless and is quite useless to-day ?
A.—Yes.

Q.—It was no part of the original scheme to dredge from the Back Bay ?
A.—No.

Q.—And therefore the whole of the wall should not have been built ?
A.—Yes, if you were going to adhere to the original plan of dredging everything from the harbour.

Q.—Wherever you were going to dredge it from you had five years to do it in, and therefore you did not want the wall until your dredging was close up to it ?
A.—No.

Q.—But the dredging was not started till 1923, and you started the wall in 1921 and therefore you had ample time ?
A.—Yes.

Q.—Consequently the whole of the money spent on the wall beyond block 8 has been costing money in interest from the date it was built ?
A.—Yes.

Q.—And that it was absolutely a wrong method to carry out the work ?—

Sir F. Hopkinson.—The dredger was supposed to dredge at the rate of 2,000 cubic yards per hour by working 15 hours daily ?
A.—Yes.

Q.—And on that computation it would do 5 million cubic yards a year. Therefore the earliest time you could possibly have the dredging finished would be, allowing for a reasonable time for starting, in 6 years.
A.—Yes.

Q.—Tell me how could anyone conceive that the dredger could, with a capacity of 2,000 yards an hour, do that quantity per annum by working 15 hours a day ? Did you ever think that it would do ?
A.—I must say I knew nothing about it at the time.

Q.—Did it ever strike you that the calculations are based on a 100 per cent. efficiency.
A.—I must say I had no opinion in the matter at all. I had nothing to do with the dredger in 1920.

Q.—Did it ever strike you that it meant practically 100 per cent. efficiency ? As a business man it ought to strike you that men and machinery could not do such a thing ?
A.—It did not strike me in 1920 because we were not thinking very much about the dredger in 1920 or early in 1921. We were only thinking about making preliminary arrangements.

Q.—Surely you were thinking about the scheme as a whole because the work of dredging effected everything else ?
A.—Yes.

Q.—You found that the efficiency of working time of the dredger is only 64 per cent., that is, 1,900 hours ?
A.—I have not gone into the figures.

Q.—(It is given in the Correspondence and Notes regarding the termination of contract with Messrs. Meik and Buchanan.) Did it not occur to you that it would take a little time to adjust your anchors, the dredger anchors, the pipe line anchors, to extend the floating pipe line, the engine room repairs, delays by heavy silt and other minor repairs ? Did not all these things occur to you in 1920 ?
A.—I had no experience of dredgers at all.

Q.—But you had experience of other machines, you had experience of railways. Does the railway engine give you 100 per cent. efficiency? They do not want repairs?

A.—There was plenty of time for repairs of that type.

Q.—These figures are based on working of 100 per cent. efficiency for the whole season?

A.—The heavy repairs are done in the monsoon.

Q.—But what about other repairs besides heavy repairs. If you had given that figure a little attention, if you had spent 5 minutes on this simple calculation, you would have seen that the maximum that you can expect is something less than 3½ millions a year and therefore doing it you will require more time than 5 years?

A.—That figure had been accepted by the Government of Bombay and the Government of India.

Q.—But surely you were representing the Government of Bombay and it was for you to tell them?

A.—The whole question had been settled and sanctioned after the exhaustive enquiries made by the Government of Bombay, the Government of India and the Secretary of State for India.

Q.—Do you mean to say the Government of India had simply sanctioned it like that without consultation?

A.—I think if the Government said that they had decided to do this work and that they are satisfied and the Government of India and the Secretary of State said that the work can be done and they appointed an executive authority to carry out the scheme, I do not think it would be one of the duties of that executive authority to go into the whole scheme afresh.

Q.—Did not any of your engineers point out the impossibility of doing 5 million yards a year?

A.—I do not remember Mr. Lewis, the then Chief Engineer, ever doing that.

Q.—You should also have done that, it is simply a matter of calculation only?

A.—With double shift Sir George Buchanan proposed to work the dredgers 15 hours every day and I had no reason to suppose that he could not.

Q.—Even with two shifts do you think that it would work something like 15 hours a day?

A.—With double shift each working for 8 hours a day, which comes to 16 hours a day, we expected to get 15 hours each day.

Q.—But they had no means to make it up. No big machine like that would have done it. You cannot start by simply turning steam at full speed. You have to oil round and to see that everything is in order and all this takes up half an hour?

A.—That is done every day beforehand.

Q.—Did you get 8 hours' actual work, that is, 12 hours' actual pumping?

A.—No.

Q.—You knew by experience how many hours it would work and were you satisfied that it could work 15 hours a day, that is, 100 per cent. efficiency?

A.—That was Sir George Buchanan's estimate.

Q.—You knew from the first two years' experience how many hours exactly you were working and therefore you should know how much it could work?

A.—The work was going on according to Sir George Buchanan's wishes.

Q.—You mean to say that Sir George Buchanan wanted to work 15 hours a day and the work was going on according to his wishes?

A.—We did not ask him.

Q.—Even if you are working 2 shifts of 8 hours each the actual working time of the dredgers every day is just about 12 hours; therefore in no circumstances you could get 5 million cubic yards. I do not say it is unreasonable but such things always happen with big machines. The point is perfectly clear that as in no circumstances, by working 15 hours a day, the dredger could turn out 5 million cubic yards, it put off the date of the completion of the whole work and ought also put off the date of the completion of the reclamation wall?

A.—Yes.

Q.—It must have been the result of some consultation or of some correspondence, because you see Sir George Buchanan saying on the 11th February 1920: "Under the orders of the Government the construction of the sea wall is being proceeded with from both ends simultaneously instead of from one end as originally the scheme provided, involving increased expenditure in machinery and plant." I take it in the sense of a protest from Sir George Buchanan?

A.—I cannot say.

Chairman.—Tomorrow will you let us have any correspondence with the Government of India or the Secretary of State or a record of any interview that took place with Sir George Buchanan with regard to the building of the sea wall from both ends?

(The witness noted it down and said that he would send it.)

Sir F. Hopkinson.—Can you tell me why dredger was ordered in May 1920?

A.—I think Sir George Buchanan told Government that an offer had been received and the prices will hold good for three months, and it was essential to place the order. The suggestion was, I think, at the time that if the order was not placed the cost would probably be increased.

Sir M. Visvesvaraya.—Can you tell us what specifications were sent out and what tenders were received?

A.—I have no recollection. I think quotations were received from 4 builders of dredgers.

Q.—Have you got those quotations?

A.—They must be in the Director General of Stores Department.

Q.—Have you not even got copies of them?

A.—No.

Q.—Did you prepare the original specifications or did you not approve them before they were sent out?

A.—The specifications were prepared and sent out before the Development Directorate came into being. It was sometime in May 1920 the order was placed and the dredger was here in March 1924 and we came into existence on the 8th November 1920.

Q.—When the specifications were sent and the dredger was ordered, had you any official connection at all?

A.—No.

Sir F. Hopkinson.—The dredger was lying here for 18 months and the cost of the dredging plant was about £1,000,000. Consequently the interest on this sum would be £50,000 a year. So there was a loss of £75,000 in order to take advantage of this offer?

A.—Yes.

Q.—Although the best thing would have been to order the plant a year later?

A.—Yes.

Q.—Whose idea was it to push it through so rapidly? It had arrived 18 months before you were ready for it?

A.—Yes. This was done on the advice of Sir George Buchanan. My impression is that Sir George Buchanan advised Government that this offer was only open for some time and if they did not place an order they would have to pay more.

Q.—But actually they would have got it for much less?

A.—Yes.

Q.—Who drew up the original statement of plant required?

A.—It was drawn up, I understand, by Sir George Buchanan and Mr. Lewis sometime in August 1920. Mr. Lewis was working in Sir George Buchanan's office and they were both concerned in getting the plant.

Q.—Practically it was ordered in November?

A.—I think so.

Q.—Had Mr. Lewis any previous experience of that sort of work?

A.—He was employed in Rangoon under Sir George Buchanan in river training work but I do not know what that was. In a letter that Sir George Buchanan wrote he said that Mr. Lewis had been employed in connection with quarry work and he also said that he had been employed in connection with the reclamation of land in Mesopotamia during the war.

Q.—I want to know by sections this reclamation wall? The 8,000 feet of this end was all wall, no rubble mound?

A.—2,000 feet.

Q.—What is the 8,000 feet?

A.—Out of this 8,000 feet, 2,000 feet is solid wall and 6,000 feet is concrete wall on rubble mound.

Q.—20 ton blocks was the original proposal of Sir George Buchanan and it was afterwards decided to use heavy blocks from the quarry. Do you know that?

A.—I think the proposal was made by Mr. Lewis because he thought that it would be cheaper.

Q.—In the meantime you got a 20 ton crane?

A.—Yes.

Q.—But it was not required and was not used. 3 ton would be ample?

A.—3 to 7 ton.

Q.—But nothing like 20 ton. This wall all together has taken 4 years to build?

A.—Yes, they could have finished in 4 years.

Q.—Have you got the unit actual cost per cubic yard to build that wall?

A.—Yes, we have got it. (The witness made a note to send this information.)

Q.—I take it that the expenditure is shown to you at least once a month in order to compare it with your estimates?

A.—Yes.

Sir Frederick Hopkinson.—Can you give me any idea how much material is available from your present quarry site? I am only asking a question about the approximate soft material?

A.—8 months' work. We notified some land adjoining the quarry. The land is being notified under the Land Acquisition Act. It is generally soft moorum.

Q.—Any possibility of getting 20 million yards?

A.—Not from that particular area, but from the neighbouring island of Salsette.

Q.—With railway connection?

A.—More or less close to railway.

Q.—Easy to get railway connection?

A.—Yes. There are two or three quarries working.

Q.—Can you tell me what information Sir George Buchanan had on which he founded his 1919 report and estimates?

A.—He was given the previous estimate made by Messrs. Lowther and Kidd, and he was apparently asked to re-examine the thing and report to Government whether the project was feasible.

Q.—Is there anyone connected with Government who is responsible for giving him such information as would lead him to have made an estimate of 367 lakhs? He says " my estimate of the cost of the work "?

A.—The Government of Bombay asked him in a letter dated the 30th of May to report on the Back Bay Scheme. They put down certain terms of reference, one of which was to examine and report on the scheme prepared by Mr. Kidd and so on.

Q.—You know how long he was out here at that time or did he make up his estimate in England?

A.—He was here early in 1919 and I think he stayed for a month or two and then he went to England.

Chairman.—On the 12th of September, he was in England?

A.—Yes.

Q.—On the 12th of September Simons and Company of Glasgow are addressing him a letter. That accounts probably for the reason why the report was drafted and ready in September, but has always been spoken of as having been submitted to the Government of Bombay in October. It took 3 weeks to come out here. It looks like that?

A.—Yes.

Q.—The report, on the face of it, is printed as September 1919, but the first record of the Government of Bombay having anything to do with it is in October 1919. It appears to have come by post. Can anyone out here tell me if Sir George Buchanan had any assistance to prepare that report and schedule of prices?

A.—I think it can be found from the records. My department was not in existence at that time. I was agent of the G. I. P. Railway.

Q.—There was no Public department here from whom he could get prices?

A.—It was being done through the General Department.

Sir M. Visvesvaraya.—P. W. D.?

A.—No. In the General Department.

Sir M. Visvesvaraya.—I know the details were being worked out in the Public Works Department in 1904 and 1905 when I was in the Secretariat. The investigation has been going on for a long time.

Sir Frederick Hopkinson.—Do you know if Sir George Buchanan was helped in these estimates by the Public Works Department?

Sir M. Visvesvaraya.—No, I do not know.

Sir Frederick Hopkinson.—What is the actual chain of responsibility. When Sir George Buchanan was in charge, he was supposed to be the Chief Engineer directing all operations?

A.—Yes.

Q.—Although he was only out here 5 weeks in the year. Did you think that was sufficient?

A.—I did not.

Q.—Did you protest against it?

A.—I told him.

Q.—What did he say?

A.—He said he thought it was enough. It arose out of a complaint from me that he was not being supplied with sufficient information by the Chief Engineer, who was then Mr. Lewis. I went home in 1922 on 3 months' leave and at Marseilles I got a letter from Sir George Buchanan, and he said that he was very anxious to have a meeting with me as soon as I arrived. I had a meeting and he showed me a letter which his firm proposed

to write to the Government of Bombay about the question of the relationship between themselves and the Chief Engineer. I pointed out that we were having a large number of estimates and surveys to do, and under their agreement it seemed to me that the Government ought not to pay any officers out here for preparing surveys of railways and works of that kind which I thought ought to be prepared by Messrs. Meik and Buchanan. I can read the paragraph from my D. O. to Mr. Monie which deals with that point. The principal question was really at that time whether Messrs. Meik and Buchanan were entitled to be paid 2 per cent. on the cost of reclamation only or whether they were also to be paid commission on the subsequent of the development of the reclaimed area. It had been apparently assumed that they were entitled to be paid on the whole cost, and I was of opinion that they were not entitled, and there was a discussion on that. I then raised the whole question of the relationship. I promised that Government would see that the Chief Engineer kept them advised as to the progress of the work, but as regards the design and method of execution of work it was for Messrs. Meik and Buchanan to take the initiative. I agreed that they were the responsible Engineers and said I did not think that Government ought to entertain in the Directorate any engineers for designing works connected with the Back Bay Reclamation as that was the business of Messrs. Meik and Buchanan. I expressed the opinion that it was the duty of Messrs. Meik and Buchanan, under their agreement, to properly carry out their part of the business, and unless they opened a properly staffed office in Bombay, I did not see how they could efficiently control their business from England, however well they might be kept informed by the Chief Engineer. The construction of storm-water drain and of a culvert to take the sub-marine cables, had to be undertaken the following cold weather. Neither of these works have been foreseen or provided for by Messrs. Meik and Buchanan. The Chief Engineer's business was to construct the work in accordance with their plan.

Q.—If you look at the agreement that was definitely settled there. It was laid down that " such works shall be commenced forthwith and all such drawings, specifications, schedules and estimates and any fresh or amended drawing, specifications, schedules of quantities and rates of estimates as may from time to time be required during the progress of the works shall be promptly prepared and forwarded to the Government of Bombay and shall become the property of the Secretary of State." So it is all laid down definitely. Actually you were doing Buchanan's work out here?

A.—Yes.

Q.—I think so. That is clear?

A.—Yes.

Q.—But instead of that Sir George Buchanan gave five weeks a year. Who took the soundings and made all the preliminary survey before Sir George Buchanan's estimate of 1919?

A.—Mr. Kidd.

Q.—There was nothing else to go upon?

A.—Nothing beyond that.

Q.—Sir George Buchanan took what Mr. Kidd had done absolutely blindly?

A.—Not only as regards the surveys, but as regards the clay, dredging and everything below the surface.

Q.—I want to see those documents. Do they give the levels of the clay? Do they show that borings were made in the hard clay?

A.—They go down to the rock.

Q.—Does anyone here know how they were made? How did they get down to the rocks? Can you tell me of any way of making a washboring do that? Do you know of any?

A.—I do not know. Kidd refers to it as a hydraulic system (another term is washboring).

Q.—I want to know how you can take a washboring through impervious clay? Who paid, the Government? I think I have seen somewhere that Government pay £15,000?

A.—Yes.

Q.—Is it possible to find anyone who made the borings?

A.—Borings were made by Mr. Kidd.

Q.—He could not have done that himself with his own hands. I want to know who actually made the borings?

A.—We might try and find out from the Port Trust or the Public Works Department.

Chairman.—Mr. Kidd uses a very curious phrase " a system of boring by hydraulic tubes was devised which proved to be perfectly reliable as well as rapid in action "?

A.—Yes.

Sir Frederick Hopkinson.—If you are boring in unctuous clay you do not require tubes, but when going through soft clay you require tubes. At the same time do you think the Public Works Department have particulars of the 75 million yards? Have you got a plan giving particulars of the 75 million yards?

A.—There is a plan showing the borings and depths.

Q.—Does it give the depth and the level of the rock?

A.—Yes.

Q.—It looks as he reached the level of the beds.

Q.—Have you got his table of quantity showing how he got these 75 million yards?

A.—No.

Q.—Because it appears to one superficially if the Marine and Port Trust deprived you of 15½ million yards it does not matter. You have still 55 millions left?

A.—I think Mr. Lewis estimated about 38 millions.

Q.—He says in his letter on page 24 of correspondence that the amount to be given up being 15½ millions, the amount available over the total area down to 70 feet below mean water level is 38,094,785 which reduced by 15½ millions becomes 22 million cubic yards. "The amount of filling required is estimated at 30 million cubic yards. We are therefore 7 millions short." Was it in consequence of that that they looked out for possible quantity from the Back Bay?

A.—Yes.

Q.—Have you got the particulars of the Back Bay borings and soundings?

A.—Yes.

Q.—How much can you get there, unlimited quantity?

A.—Oh, no.

Q.—Strictly limited?

A.—I think we have got a later statement where the estimated quantity is given. Mr. Lewis sent him all the borings.

Q.—Taking a broad view of the whole work you would not call it a difficult or risky job, would you?

A.—I should call it a straightforward job except for the dredging.

Q.—Would you call it a simple easy job?

A.—When I was first asked to join the Development Directorate it seemed to me to be a straightforward job. I did not expect the building of walls to be difficult operation.

Q.—Was it only on Sir George Buchanan's recommendation that the Government decided to do it departmentally?

A.—I think it was on his recommendation.

Q.—Don't you think it was pre-eminently a work which should have been advertised to contractors all over the world?

A.—I think it should have been, but I am doubtful whether under the conditions at that time you would have got contractors to tender. That was Sir George Buchanan's opinion, I know. Things were rather unsettled at the time and there had been considerable fluctuations in prices of material and labour.

Q.—And therefore unless there was very great urgency for it, would it not have been wise to have put it off for two or three years?

A.—It was a matter for Government.

Q.—I am asking your opinion?

A.—If it was not a matter of urgency it would have been better to have put it off.

Q.—It was not a matter of urgency since it was not coming into operation for 8 years?

A.—My own opinion is on record on the proceedings of the Development Committee of 1914, when everybody was examined and asked to state whether the Back Bay Reclamation would be a good thing, and my view was that if there was a large demand for additional housing in Bombay, I thought the development of the north of the island and the neighbouring island of Salsette and the provision of proper means of communication between the business part of Bombay, roads and railways, should take precedence over the reclamation of a large part of the sea. That was the view I took then, and I do not think I have altered that view. I was asked the work having been sanctioned by Government, whether I would take up the work.

Q.—In view of the magnitude of this work, don't you think that it was a work that would call for the very best business management that could have been in the whole world?

A.—Yes. I do not think that it was a difficult thing.

Q.—It was a big thing?

A.—Yes. A very big thing.

Q.—Unusually big?

A.—Certainly.

Q.—There are few such works done in modern times?
A.—Yes.

Q.—And you agree with me that it calls for the best, most experienced people in the whole world, and should have been called in to control it regardless of cost?
A.—Yes.

Q.—Do you think it has had that?
A.—I think that it was a straightforward job.

Q.—Do you think that it had the management of that character?
A.—I think had the management it deserved. I do not know how far I am personally concerned in this.

Q.—I put you aside. Meik and Buchanan were doing the work. I ask you, do you think it had the management it deserved?
A.—In that view I do not think it had the management it deserved.

Q.—Nor do I.

Q.—Had they decided to do it departmentally, don't you think the proper procedure would have been to search the world and offer 20 to £30,000 a year for the best man available to manage this thing?
A.—I cannot imagine the Government doing that.

Chairman.—It might have been a very prudent thing to do?
A.—Yes.

Q.—Don't you think it would have paid well to have done such a thing?
A.—I think probably it would have.

Q.—Looking back on what you know now, don't you think it would have paid to have done such a thing?
A.—After the dredging plant was ordered?

Q.—At the very inception of the scheme?
A.—I think it would have paid, but after Government were committed by ordering very expensive plant it was rather limited.

Q.—Even then do you not think it would have paid?
A.—Yes, but he would have had less scope than if he had been called in early.

Q.—I have been a little in doubt about the estimate of the Colaba scheme. That is all suspended, isn't it?
A.—Yes. There is a little rubble deposited, but it has been stopped.

Q.—(*By Sir F. Hopkinson*).—I asked you some time ago, and I do not think we got a full answer. Tell me the chain of responsibility before and after Sir George Buchanan's connection with the work. During the time that he was Engineer did he give instructions to the Engineer on the site?
A.—He sent instructions.

Q.—Direct or through you?
A.—They were addressed to the Chief Engineer but they went through me, and a separate copy was sent by the firm for record in my office. It was correspondence between Messrs. Meik and Buchanan and the Chief Engineer, and *vice versa.*

Q.—That of course was very difficult?
A.—Yes.

Q.—To get an answer to a question which was too long for a cable you cannot get an answer for a month?
A.—Yes.

Q.—So that when you are doing seasonal work, that is of very much greater importance to you than if you were doing yearly work and not limited to 6 or 7 months' work?
A.—Yes.

Q.—It seems to me an unsuitable arrangement. Do you agree with me?
A.—I also think so now.

Q.—In fact the Bombay Government had stipulated for his presence in Bombay. That was the arrangement?
A.—Yes, at the commencement of each working season.

Q.—He was to stay if required, during the major portion of the year?
A.—I do not think so. He was to devote the greater part of his time to the work. But I do not think that implied that he should be present here.

Q.—Did that imply that during the working season he was to be in Bombay? You were saying his actual attendances here at Bombay were so infrequent as to make it an unfortunate arrangement?
A.—Yes.

Q.—Since Sir George Buchanan ceased to have any connection with it, what has been the chain of responsibility? Who is actually responsible for giving orders for carrying on the entire works?

A.—The work is going on, such work as is going on, of course. It is done by the Chief Engineer, and he refers for orders to me, and I refer to Government, that is, I refer through the Secretary to the Honourable Member. I put up recommendations if any.

Q.—Can you make any alterations?

A.—Any alterations have to go to Government.

Q.—Is not that waste of time?

A.—For instance, we do not know whether we ought to begin reconditioning. We do not know whether Government propose to use the plant next season in Back Bay or not. The Chief Engineer puts the case to me. Then I have to put the case to Government. I have not the authority to tell the Chief Engineer to go on.

Q.—That again seems unfortunate. You are the professional adviser of the Government at present?

A.—Nothing has been said but that is what in fact it amounts to since the termination of the agreement. The position is rather difficult and it arose in connection with the annual reports. I have always treated them as reports by the head of the Executive as to the progress of an engineering work only. They never went to the Hon'ble Member. They were issued on my own responsibility.

Q.—Do the Government review your report?

A.—I say the Government did not. They were always issued by me. They gave the progress of the work as a work. Government had all the information.

Q.—You were very careful not to give information away?

A.—I gave the information to Government, but I think it was for the Government to say how much or what they proposed to make public. Last year after the figures were known in July there was a very full discussion in Poona, and it was decided to write a strong letter to Meik and Buchanan, but as the whole question was under consideration by the Sub-Committee Government considered it better not to make any announcement at that time, but to wait until they got the report and then to publish that at once.

Q.—What has become of the *Jinga*?

A.—She was purchased in order to be converted into a boosting station for the "Kalu" for working in Bombay. It was only bought quite recently, some time last year. It was not bought at the same time as "Kalu."

Q.—I take it generally speaking that the Chief Engineer has full power to carry out the works according to his own ideas.

A.—Yes, he has full powers.

Q.—Buchanan made a statement that it took him nearly a year to get a reply to a letter. Is that so?

A.—I think it must have been rather an exceptional case. The letter must have been lost or anything like that should not have happened.

Q.—Was not there a proper system of cost accounting?

A.—Not at the commencement. We simply had an audit.

Q.—How could Sir George Buchanan know how the work was going on unless he was given the costs?

A.—It was difficult to commence with, because the Government of India thought it was not necessary to have an Accounts Department of our own. They said the Government Audit Department would audit accounts and give us a *pro forma* statement, and that would be sufficient. We found out that it was not sufficient, and after a great deal of correspondence and trouble we got the Government of India to agree to keep our accounts in a commercial form. The Government audit only requires that all expenditure must be covered by a sanctioned estimate, and that for every rupee spent there must be a voucher.

Sir M. Visvesvaraya.—Their contentment does not mean much for us

Q.—Sir George Buchanan says that for years he has been struggling against Government extravagance and inefficiency. Is not he responsible for extravagance and inefficiency?

A.—Exactly.

Q.—Has he made any charges when out here?

A.—Never. He has generally been the other way. He has been rather complimentary in most of his reports. I could not understand this at all.

Q.—At the bottom of page 4 Sir George Buchanan says all control was transferred from his firm and himself to the Director?

A.—That is absolutely untrue.

Q.—Again he says the Resident Engineer was not given an office in the centre of the work. Is that true?

A.—He was given an office in the block of offices where the Development Directorate Offices are. It was more convenient for everybody.

Q.—Is it convenient for the works?

A.—The Deputy Chief Engineers are there.

Q.—Then further on he says his visits to Bombay became literally a weariness to the flesh. As a matter of fact it was only 5 weeks, (*Chairman*:—5 weeks is an under-estimate) because no one took any notice of him. That is the first allegation. What do you say about that, Sir Lawless?

A.—Unfortunately there was mutual antipathy between Mr. Lewis who was the Chief Engineer and Sir George Buchanan. Mr. Lewis had been nominated by him. He was with him at Busra and with him at Rangoon and the impression I formed was it was something which dated a good way back. What it was I do not know, but he was certainly nominated by Sir George Buchanan, but when Sir George Buchanan came out here it was very difficult to get Mr. Lewis to speak to Sir George Buchanan. They did not seem to be able to get on at all.

Q.—When did Mr. Lewis leave?

A.—In July 1924. He went on 6 months' leave preparatory to retirement under the 55 years rule. Government could have retained his services as a special case on a temporary appointment, but in view of the difficulty between Sir George Buchanan and Mr. Lewis it was not considered advisable to extend the appointment.

Q.—Was very much done then, July 1924?

A.—No.

Q.—And Sir George Buchanan says, "My reports were pigeon-holed". Is that true?

A.—That refers to a report with which he submitted a revised estimate of 598 lakhs. He handed it to me on the 11th February 1922. It was a report with an estimate amounting to Rs. 4,98,89,000. At that time the sanctioned project estimate of 702 lakhs was approaching completion, and of course I had discussed it on numerous occasions with the Chief Engineer, and I knew it was going to be in the neighbourhood of 7 crores of rupees, and in this report Sir George Buchanan said that his estimate of 498 lakhs had been arrived at in consultation with Mr. Lewis after a very complete investigation. So I did not know quite what to do with this estimate, because there was a very great difference between it and the project estimate that we were just getting out, and for a few days I did nothing with it. Sir George Buchanan was not satisfied with that. He wrote to Sir George Lloyd and sent him a copy of the report and estimate direct and I think he indicated that sufficient importance was not attached to his report and estimate. Sir George Lloyd then sent for me and I explained what the position was. And he asked me to see Sir George Buchanan, and he approved of the action I took in not making use of the report and estimate at the moment, and he asked me to explain the position as fully as possible to Sir George Buchanan, and I did and I told him that the reason why I thought it would be inadvisable to make use of it was that we thought that his estimate would be found to be a good deal too low mainly owing to insufficient provision having been made for roads, etc. After discussing it with him the day before he left he asked me to return the estimate and report, and he handed it back to me the next morning with the total estimate of Rs. 598 lakhs, a crore of rupees having been added to it.

Q.—How was the 1 crore added, as a lump?

A.—It was added on in a lump. The estimate was retyped.

Q.—Separate items were probably increased so as to show a total of Rs. 1,00,00,000 more?

A.—No, I think it was added to one figure.

Q.—You have been speaking of the 11th February. Here in a report of Sir George Buchanan of that date is an estimate which gives 668 lakhs. I do not see anywhere there a lump sum of 100 lakhs by which any estimate has been added to?

A.—In the 598 lakhs report we have not got the original. The original was handed back to him and he gave the revised.

Q.—You think that he altered the various prices throughout with certain percentage to make up his 100 lakhs, or what?

A.—I cannot make how he added this extra 100 lakhs.

Q.—At least you would not be right in saying that he threw into the accounts 100 lakhs in one lump sum?

A.—I am only right in saying that the total of the estimate was increased by 100 lakhs.

Q.—By spreading over various items?

A.—Quite likely.

Q.—Have you got cross-sections of the reclamations for blocks 3, 4, 5, 6 and 7 showing the extent of the silt?

(*The Chief Engineer*:—We have got diagrams to show the cross-sections.)

Q.—Have you formed any opinion as to what would happen to these various blocks if nothing was done?

A.—I think it looks as if the silting would continue to go on.

Q.—At what rate?

A.—I think it is difficult to say. The Chief Engineer thinks it would be difficult to fix the rate of silting in the future.

Q.—You know what it has silted in the past?

A.—Yes.

Q.—Is it appreciable enough to measure?

A.—Yes.

Q.—Then you might let us know that. I was rather taken with the suggestion of Sir Alexander Gibb that it might be advisable to go on with building of the 1,800 feet of the wall that is left unfinished, that is if the siltings were going on?

A.—It seemed to me a very reasonable suggestion. The Chief Engineer does not agree on that point.

Q.—Surely if the thing is silting, you should do everything to hold the silt in?

A.—That is what one would think.

The Committee assembled at 11 a.m. on the 5th August 1926, when Sir Lawless Hepper's examination was resumed: Present—Chairman, all Members and Secretary.

Chairman.—The Committee desire me to mention a statement made in an abbreviated report of the evidence given by a contemporary yesterday. The question which is put into the mouth of one of the members of the Committee was not in fact the question put by him but was the repetition of an answer given by the witness. The passage runs: " Continuing witness said that Lord Lloyd was anxious that the work should be started from Marine Lines because it was seen by him and from a spectacular point of view it was desirable to show some work. The next question is given as follows:—Was simply to give some spectacular display and for propaganda purpose the work was started at Marine Lines." Sir Frederick Hopkinson did not use the words for propaganda purposes. It was part of a subsidiary answer given by the witness?

A.—I think I said it was my impression.

Sir Frederick Hopkinson.—Did you introduce the word propaganda?

A.—Yes, " propaganda ".

Chairman.—Sir Lawless Hepper agrees that he used the word " propaganda " but qualified it by saying that it was his impression that that was the object?

A.—That is right.

Sir Frederick Hopkinson.—Have you got the plan showing the position of the dredging area of the reclamation?

A.—I have got only a small sketch.

Chairman.— Before we continue the examination there is one other matter for the gentlemen of the press. Mr. Kidd reported that he had made 1,314 borings in his project of 1912. In his report he describes the borings in a method which seem to show that they were experimental. That is, he was adopting a plan apparently new to him. Now what we really want is to find out if there are any witnesses available in India who were present at the time when those borings were taken. We want those witnesses here to ask them what was the method of boring, how it was done, how long it took and what were the results, and generally to find out how it came about that Mr. Kidd was enabled to record 1,159 borings giving various sections of the clay. If you gentlemen could put in an announcement that the Committee are very anxious to get in touch with any witnesses who assisted Mr. Kidd in taking the borings in 1912 we shall be very greatly obliged. We are sending a cable to Mr. Kidd enquiring whether he can give the names of any witnesses. It is quite possible there are many men in the city who will be able to tell us what was done, and this will have a very important bearing on the findings of the Committee.

Witness handed over a map to Sir Frederick and said:—This shows the reclamation and the dredging area.

Sir Frederick Hopkinson.—Can you tell me which part of this area has been refused by the Royal Indian Marine and the Port Trust for dredging?

(Witness pointed the portion.)

Q.—After the objection of the Royal Indian Marine and Port Trust to the dredging in the northern area, the dredging in the southern area would give a greater distance than 10,000 feet for filling up the reclamation, is not that so?

A.—That is so.

Q.—And therefore it was physically impossible for the dredgers to do work assigned to them at the speed intended?

A.—Yes, they could not do without exceeding the length of 5,000 feet of pipe line.

Q.—You said yesterday that the trouble arose at low water at the shore connection of the boring of the clay?

A.—That was when the clogging occurred.

Q.—Is that due to difference of head of water, the difference of head material had to be pumped or was it connected with something inside the shape of the pipe?

A.—I am afraid I cannot say that myself. The Chief Engineer tells me he thinks it is a question of difference in head of water.

Q.—Therefore it follows that the pumps were not so designed as to properly deal with dredging at low water?

A.—I think this was allowed for in the specification.

Q.—But was it sufficiently allowed for because your trouble arose at low water?

A.—Yes.

Q.—What I am suggesting is that the difficulty at low water arose through the pumps being given more to do than they were fitted to do?

A.—It seems likely but I should rather that the Chief Engineer and Mr. Brims were asked that question.

Q.—These are all single pumps? Are not they?

A.—Yes.

Q.—Is it not the universal modern practice for pumps on dredgers of this description to be made in series and not singly?

A.—I am afraid I could not say I have no experience.

Q.—There is one thing we did not finish yesterday and that was the present position of the dredging plant. You told me that the " Sir George Lloyd " was undergoing annual refit?

A.—Yes.

Q.—Can you give me any idea what it is going to cost?

A.—We don't yet know how much there is to be done—certain parts are being dismantled for examination.

Q.—But can it all be finished before the beginning of the next season?

A.—Yes.

Q.—Now what is the condition of the " Colaba "? Isn't she in a rather serious condition?

A.—Excessive vibration occurred last season.

Q.—No, the condition of the dredger at present, what state is she in?

A.—The engines have been taken out in order to complete the stiffening under the engines, which was not possible to do during the working season.

Q.—Who advised that stiffening should be done?

A.—The Chief Engineer and the Naval Constructor of the Government Dockyard.

Q.—Who has done the work?

A.—The first part of the work was done in the Government dockyard, but the dockyard authorities told us that owing to work of their own they would not be able to undertake this stiffening under the engines in time for the " Colaba " to be ready for the next season, and so it is to be done at Mazgaon factory.

Q.—Have you got a contract for doing it?

A.—There was no contract.

Q.—I suppose no contract has been drawn up as to what is to be done and how it is to be done?

A.—The engines have only just been lifted out.

Q.—Can you give me any idea of what the repairs of this boat are going to cost?

A.—The Chief Engineer says he thinks they will be about Rs. 45,000 altogether of which we spent Rs. 25,000 on the work that was done in the Government dockyard during the working season.

Q.—It means the alteration is very much more extensive?

A.—The major part of the stiffening has already been done for Rs. 25,000.

Q.—That doesn't point to anything very very serious?

A.—Well, the Chief Engineer will produce the plan showing the actual work done.

Q.—With regard to block 8, would it be feasible to finish moorum filling in a short time; I mean, would it be feasible having regard to the nature of the dredged filling?

A.—We do not think so. We must allow the filling to solidify to a certain extent, otherwise the moorum would sink and we would lose it.

Q.—You say somewhere else you lose it from the top?

A.—We have not anticipated that we shall be able to do very much in the moorum covering until probably next December or January.

Q.—You mentioned yesterday that you did not expect to finish that area until 1928 whether it would be feasible physically possible to do it, you say not?

A.—I don't think so.

Q.—What is the state of the " Kalu "?

A.—The " Kalu " is in good condition. It is a very old ship, of course, but she has been re-conditioned. When she was docked after last season's work she was found to be in a better condition than the engineers expected.

Q.—Can you give me any idea as to what the alterations to the " Kalu " will cost?

A.—There are no alterations and repairs. The annual overhaul, the Chief Engineer tells me, will be about Rs. 10,000.

Q.—That is very little, that seems to be a very small sum?

A.—The Chief Engineer and Mr. Brims would, of course, be able to give details about that.

Q.—And now with regard to " Jinga " what money has been spent on the " Jinga " including the new pump I saw on the reclamation the other day. I think I will leave a lot of these questions until we have Mr. Brims and Mr. Elgee here. My object for putting that to you was that they may know what is wanted? I understand that the " Jinga " is intended to be used as a booster to the " Kalu ", and consequently your dredging for next year in Back Bay will be proportionately increased in cost in as much as the material will be handled by both " Kalu " and " Jinga "?

A.—The provision is for the " Kalu " to work 6 months and the " Jinga " to work for 3 months only, because it is anticipated that if the experience is the same as it was in 1924-25 the hole that was dug out by the " Kalu " last season will be filled up mostly with sand.

Q.—These holes fill up every year?

A.—The first year the holes were completely filled up and the engineers anticipate that it will do so again, but we cannot tell.

Q.—You have taken no soundings?

A.—The sea has been too rough.

Sir M. Visvesvaraya.—They won't work simultaneously?

A.—They were during the last 3 months of the season.

Q.—That is when the distance is too great?

A.—The " Jinga " would be moored in the hole where the " Kalu " has worked, and the " Kalu " itself would be further out in the Back Bay.

Sir F. Hopkinson.—Did " Sir George Lloyd " work aground on her first trial?

A.—She did go aground on the first season.

Q.—Did she do much damage?

A.—The damage was very very slight.

Q.—Of course, had Sir George Buchanan's ideas been satisfactory there would have been no other dredger required but the " Lloyd " and the " Colaba ". There is no provision in his scheme for pumping from the Back Bay?

A.—No, there is not.

Q.—That originated afterwards?

A.—Yes.

Q.—I presume all your floating craft is insured?

A.—Yes. It is all insured.

Q.—The reason I am asking is that I see in one of the estimates you take credit for 75 lakhs of rupees for the value of the plant when you finish the work; that is approximately half a million sterling?

A.—It is in the sanctioned project estimate.

Q.—Do you consider that as a rosy estimate?

A.—Yes, I do.

Sir Frederick Hopkinson: So do I. The capacity of the " Lloyd ", I made a rough calculation this morning, of water alone is something like 10,000 cubic yards. Now have you checked them? Is that right?

A.—Yes.

Q.—So that about 2,000 yards of clay from dredgings you would want reckoning on 20 per cent. of solid material going through the pumps?

A.—Yes.

Q.—Have you ever known such a result to be achieved?

A.—I have had no previous experience of dredgers at all. This is the first dredger I have ever had anything to do with.

Q.—You hope it will be the last?

A.—I sincerely hope so.

Q.—I am going to ask you a rather delicate question. Are all your staff connected with the dredging in a happy or an unhappy state of mind?

A.—I think myself they are in a happy state of mind, I have heard nothing to the contrary.

Q.—Are they not thoroughly disheartened?

A.—No, I do not think so. They have small grievances.

Q.—No, I am not talking of that?

A.—The Chief Engineer tells me that they all work splendidly and are doing their best.

Q.—What I want to know, are they disheartened at the state of affairs. I suggest to you that they are?

A.—I have heard nothing about it but Mr. Brims is daily in contact with them.

I think, if I may mention a personal matter, if I had anything to do with the pumping I should have been heartbroken at the results achieved.

Sir F. Hopkinson.—Supposing Government decided to go on with blocks 2, 3, 4, 5, 6 and 7 ?

A.—I have not come to a definite conclusion but I have very serious doubts whether certain of these blocks could be filled by dredging.

Q.—I presume you have consulted your engineers on this matter?

A.—I have, but we have not come to definite conclusions.

Q.—You have been in great doubts as to whether it can be done?

A.—Yes. I was going to raise that question in connection with the estimates that you asked me to prepare. Whether it is intended that we should base our estimates on the proposals of Lowther, Kidd and Sir George Buchanan that the whole scheme should be done by suction dredging, or whether we should prepare estimates for carrying out the scheme in the way in which we believe it can, in practice, be carried out. It is of course no use preparing an estimate to do a thing which cannot be done.

Sir M. Visvesvaraya.—Whether it was by dry filling, dredged filling or by both?

A.—I said that if it is not possible to do the whole work by dredging. It is no use preparing estimates on that basis.

Q.—Will it take a longer time to carry out the work by dredged filling than by dry filling?

A.—It might not be a practical proposition to fill certain of these blocks with dredged material.

Sir F. Hopkinson.—The point is this ; we have asked Sir Lawless Hepper to prepare an estimate showing how much the whole scheme will cost if Government decides to proceed with it. Now I have asked if he thinks the dredger could do it and he says that it cannot do it. I want him to tell us how he will do it and by what means, and what would the cost be in the way in which he would do it. We also want to find out within the next fortnight whether sufficient soft material can be found in order to fill up the portions that he thinks cannot be done by dredger or whether it would be done cheaper than by dredger.

A.—I have no doubt as to the material ; it can be got.

Q.—It is a very important point and I would like you to tell us to-morrow approximately whether it can be obtained and from where, and the estimate for it also.

A.—But the Port Trust, the railways, and the Improvement Trust and everybody get their moorum filling from Salsette.

Q.—Supposing we want 15 to 20 millions cu. ft.?

A.—I do not know if we can get such a large quantity.

Q.—Do you see any difficulty in filling blocks 2, 3, 4, 5, 6 and 7?

A.—I do not see much difficulty about 5, 6 and 7. 7 is a shallow block.

Q.—Can you tell us the depth?

A.—The average depth of block 7 is 12·75 feet, 6 is 14·67 feet and 5 is 16·8 feet and when you get to block 4, it is a little over 20 feet.

Q.—Of course you will give us quantities and details?

A.—Yes.

Q.—What was the damage done to the cutter blade of the dredger "Sir George Lloyd" ?

A.—Two of the blades were broken and we had to get a new one. We had a spare cutter available.

Q.—Can you tell us how that one was broken?

A.—The reason was that it touched a rock and the engineers at the time thought that there was a flaw in the material, and we sent the pieces to a firm, who are specialists in examining fractures for flaws. The report was indefinite because the pieces were rusted.

Q.—That is the only time you had any trouble?

A.—Yes.

Q.—Are there any loose stones or boulders in the clay?

A.—There are a few boulders.

Q.—Of what sizes?

A.—I find it difficult to answer. I have seen stones coming through myself and one generally sees a certain amount of them in the clay when pumping is going on. I do not think they were very large.

Q.—Were those too large boulders to go into the cutter blades?

A.—No.

Q.—So far it is not of very much consequence about the boulders you have come across?

A.—It has never been held as presenting any serious difficulty.

Q.—Can you now tell the dates Sir George Buchanan was here?
A.—Not yet.

I can give you the information regarding the beginning of the wall at both ends. I find on the Secretariat file a telegram dated 15th July 1920, from the Secretary of State for India to the Governor of Bombay. It reads "Your telegram of 13th. My telegram of 12th repeated in 1919 cipher code." *Begins* "Buchanan reports that it is practicable to begin work on the Back Bay scheme on both ends simultaneously in constructing the wall. The bulk of the work will be carried out from the western end, the stone being carried to the site by railway from quarry at Andheri but a considerable length of wall could be built from the eastern end as wall would be of concrete throughout and sufficient stone can be procured locally. To begin building the wall in two places will not materially advance matters unless reclamation can also be proceeded with. Buchanan is considering whether the new dredger and 'Kalu' can work simultaneously on eastern and western areas. Buchanan understands Lewis is on his way Home and he will discuss all these points fully with him". This was in July 1920.

Q.—Have you got the telegram to which this telegram is a reply?
A.—I have not been able to get it. It is not on the Secretariat file. It was apparently a telegram from the Private Secretary.

Q.—I want to point out that that telegram only states it was practicable. There is no order that it should be done. We want to know how it came about that the wall was built at both ends simultaneously? On whose instructions was this done? That telegram only says that it is practicable. It says nothing about expense.
A.—There was this telegram and another one also. The second telegram is dated 17th July 1920. It is from the Secretary of State for India to the Governor of Bombay and reads "Your telegram of the 4th instant and my reply repeated July 15th. Buchanan reports now satisfied myself that the dredger 'Kalu' and the new dredger can work together on Bombay reclamation and therefore asks construction of the wall can proceed from both ends simultaneously. Buchanan asks for further early orders as to whether he is to proceed on these lines as considerable changes in designs of arrangements for execution of work will be necessary".

These two telegrams were sent to the Secretariat by the Private Secretary on the 22nd July 1920 with a letter as follows :—

"I am to send you the enclosed copies of two cables received from the Secretary of State for India regarding the Back Bay Reclamation."

That is when the telegrams first came on the Secretariat file in the General Department. The two telegrams from His Excellency the Governor of Bombay to the Secretary of State for India referred to in the Secretary of State's telegram are not on the records of this office so I presume that they must have been sent by the Private Secretary. The orders issued by Sir George Curtis on the second telegram.....

Chairman.—Who is Sir George Curtis?
A.—He was the Honourable Member in charge of the General Department.

He notes on the second telegram "Reply to telegram of July 17th may be, work may start from both ends".

Q.—Was that the actual telegram sent?
A.—No, that is the noting on the file.

Sir F. Hopkinson.—It says work may start. That is not ordering the work to be so started.
A.—Sir George Buchanan took it as an order to start the work at both ends.

Q.—In Sir George Buchanan's report of February 1922 he stated that wall had begun on both edds simultaneously under the orders of the Government? Do you know if he made any protest? Did he say that it will result in a very large expenditure?
A.—I have nothing on record that he did. I have got a memorandum of the conference held between Sir George Buchanan, Mr. Lewis and myself in London in August 1920. It begins by saying the Government of Bombay have now directed that the work shall proceed from both ends simultaneously and in order to facilitate building of the wall from the Colaba end, we have changed the line of the wall so as to bring that portion ..... and so it goes on to discuss the matter of plant required.

Sir F. Hopkinson.—But he does not say there that he protested against what might be a very extravagant method?
A.—He apparently accepted it as wish of the Government.

Chairman.—On the 12th of August the Development Directorate had not been created and you were attending a conference in England on that date?

A.—I was in England on leave.

Q.—Were you officially instructed to attend such a conference?

A.—No. I got a letter from Sir George Buchanan in which he said "I wonder whether you have any news from Bombay regarding the new organisation about the Back Bay Reclamation, of which you are to be the head."

Q.—The document that we have got at present is a telegram dated 29th July 1920 from the Government of Bombay to the Secretary of State saying "Your telegram of 17th July, work may start from both ends." It was apparently based on Sir George Curtis having made a note "work may start from both ends."

Sir Frederick Hopkinson.—From these telegrams it appears that it was the instruction of the Government of Bombay to start work from both ends."

A.—Yes, I think so.

Sir Frederick Hopkinson.—That was in July 1922?

A.—At present I have no correct information that the scheme had been sanctioned. I have received a letter asking my opinion as to the possibility of beginning a wall at both ends simultaneously. That was on the 14th of July. I saw him in August. The date of this memorandum is the 12th of August, and there he says that the Government of Bombay had directed that the work should start from both ends.

Chairman.—Could you give the Secretary a record of your interviews?

A.—Yes. I have other papers here between February 1920 and October 1920. Some of them are copies of Sir George Buchanan's memorandum and D. O. letters to me before my appointment, of course. I can give copies of all these papers to the Secretary or let him have the file.

Mr. Ewbank.—The file would be more convenient.

Witness.—There is a memorandum here rather of an early date which mentions the names of the firms from which quotations were received for the dredger.

Sir Frederick Hopkinson.—Could you tell us anything about the firms from whom quotations were received?

A.—On the 27th of February 1920 Sir George Buchanan wrote to me and said "I enclose herewith copy of my note which I sent to Monie and I understand he is going to discuss it with His Excellency to-morrow." It is a long note showing what he proposes to do, and in the memorandum it is stated that under orders from His Excellency his firm took in tenders from three other dredger builders, namely, Messrs. Fergusson Bros., Fleming and Fergusson, and Messrs. Lobnitz. He notes "No. 1 declined to tender, No. 2 wished for a great deal of information which was not available and I received a cable yesterday from my firm which is as follows about No. 3, 'Lobnitz tender £840,000 for two complete dredgers of 2,000 cubic yards capacity and pipe line, one dredger being used for intermediate stations.' I have no details of Messrs. Lobnitz' tender nor is any time for delivery given. But I do not see the necessity for two dredgers." So Lobnitz did not give a price for what was actually bought, and the plant was bought from Simons.

Q.—They provided two dredgers and two boosters?

A.—No.

Chairman.—One dredger and one to do the boosting?

A.—It seems to me exactly the same.

Sir Frederick Hopkinson.—A booster is not a dredger?

A.—One dredger is being used for intermediate station. "In any case I do not see the necessity for two dredgers and I recommend that Messrs. Simons' tender be accepted."

Q.—From these telegrams it would be clear that it was the instructions of the Bombay Government to begin the wall at both ends?

A.—I think it was.

Q.—But nothing appears to have been done as regards warning the Government as to the increased cost of working in that manner?

A.—I do not think Government were warned. But if the wall was to be built from Marine Lines I do not think it could have been deferred until 1929 as, I think it was suggested yesterday, because if the pumping had come up to Sir George Buchanan's expectations by the end of the next season or in May 1927 we should have done 20 million cubic yards of pumping leaving only 5 millions and blocks 1 and 2 alone are 4½, that is, by the next season we should have done everything except blocks 1 and 2.

Q.—What was the necessity for the "Kalu" to be put in Back Bay?

A.—The original scheme was to do with the "Sir George Lloyd" only. The "Kalu" was purchased in 1919, but the idea was to use it for the East Colaba Reclamation.

Chairman.—That is on the 24th of September, 1919 he recommended the purchase of the "Kalu" and ultimately she was purchased on the 21st November for £75,000?
A.—Yes.

Sir Frederick Hopkinson.—September 1919, that was when the original scheme was prepared.

Chairman.—And the official announcement of the intention to carry out the scheme was made on the 3rd August 1920.

Sir Frederick Hopkinson.—Was it not on the report of Sir George Buchanan that in August 1920 the scheme had not been sanctioned?

Chairman.—Sanctioned on the 3rd August 1920.

Sir Frederick Hopkinson.—The dredger had been ordered previous to that?
A.—The "Kalu" was ordered in 1919.

Chairman.—"Kalu" was recommended to be bought by Sir George Buchanan on the 24th September 1919 and actually bought on the 21st of November of that year for £75,000. Is that right?
A.—Yes, that is right.

Q.—The Director General of Stores was ordered to put the purchase of the dredger in hand in May 1920?
A.—Yes. It was in May 1920 that the scheme was sanctioned by the Secretary of State. On the 4th of May the Secretary of State wired his approval subject to a suitable scheme of finance being available.

Q.—And in June final sanction to the Taxation and amendment of the draft clauses of the bill?
A.—Yes.

Sir Frederick Hopkinson.—I gather from this volume of correspondence and notes regarding the termination of the agreement with Messrs. Meik and Buchanan (at the bottom of page 9) that Sir George Buchanan had really very little to do with the construction of the reclamation. They evidently got out the original designs and thereafter they practically did nothing?
A.—That has always been my view.

Q.—You really have been doing the Chief Engineer's work on the spot, and indeed you go further and say that you can manage just as well without Sir George Buchanan?
A.—At that stage I thought I could.

Q.—This in 1925?
A.—Yes.

Q.—Was not that remark made on the results of the past?
A.—Yes, it was. I should not have cared to say that at the beginning.

Q.—Doesn't that throw greater responsibility upon you and your engineers?
A.—What I had in my mind was that, the present position being what it is, our own engineers can in the future, do just as well, whatever is to be done, and can be done, by themselves as if they were being instructed by Sir George Buchanan.

Q.—I presume they had been doing that before December 1925 because Sir George Buchanan was not out?
A.—He was out in the cold weather of 1924-25; that was his last visit.

Q.—So really you and the Engineers had been carrying on the work for 10 months?
A.—Yes, in accordance with his instructions, and in accordance with his drawings.

Chairman.—In 1924 Sir George Buchanan arrived in Bombay on the 24th of October and he left on the 7th January 1925?
A.—Yes.

Sir Frederick Hopkinson.—Approximately 2 months?
A.—He was not in Bombay the whole of that time. He was in Dwarka in connection with some other work.

Q.—He did not give much help?
A.—No. It is rather difficult to give an idea of what portion of time he was in Bombay. Nearly every year he was away a portion of the time from Bombay.

Q.—Can you give us an idea where he was?
A.—I shall see if we have any papers in the office.

Q.—Mr. Elgee, could you give me a sample of the silt in a glass bottle, and I should like to have also a sample of the silt you have outside the reclamation?

Mr. Elgee.—In Back Bay or the Harbour?

Q.—I want both. I want a sample of the silt that you have been dredging in the harbour. I would rather have it taken from the harbour. Can you do that?
A.—Yes.

Q.—And I want a little of the silt that you say is being deposited outside the Back Bay Reclamation wall; also a sample of what you said would not travel over the wall you had built?

A.—Yes.

Q.—Did you ever take periodic samples? Don't you preserve the samples as a matter of interest?

A.—We have a few but not worth producing.

Q.—I gather, Sir Lawless, that you are satisfied that the best results possible have been got out of the dredger " Sir George Lloyd "?

A.—No, I think, we might do slightly better. I have suggested that we might be able to do 2 million cubic yards in a season, allowing 2,000 pumping hours. We did 1,905 pumping hours last year.

Q.—I notice that Mr. Neilson takes an average of 1,600?

A.—I think that rather low. Last year we lost 10 days owing to bad weather and we lost 17 working days on account of the stiffening of the " Colaba ". I think the 17 working days may be taken exceptional, and if you allow an average of 12 hours for those 17 days it brings us up to 2,000. Taking 2,000 pumping hours at about 1,000 cubic yards per hour gives 2 million cubic yards per season. That is about the outside.

Q.—That is 2 million yards?

A.—I do not think that we are likely to exceed that.

Q.—It is comparable with Sir George Buchanan's estimate of 5 millions, what he designed the dredger to do, and doing that do you think you are getting the best possible results out of the dredger?

A.—I do not think we are likely to get any more in that material.

Q.—Do you think you are getting as much as your dredger can give?

A.—I think so, with the materials we get.

Q.—Which material do you mean?

A.—Both materials, mixed.

Q.—So under the most favourable conditions as the machinery developed the whole scheme would have taken 12½ years to pump?

A.—Yes, I think it would.

Q.—Of course, that is taking from your experience of the past, a rather favourable view of what you were going to do in the future. Do you think it might be done?

A.—We seemed to have done a little better every season.

Q.—That means that from the time that the dredger started work a period of something like 15 or 16 years would be required to finish the whole work?

A.—Yes, to finish the whole work if the whole scheme was completed by dredging.

Q.—That brings the completion to 1938 or 1939, that is 16 years?

A.—Yes.

Chairman.—Allowing for the fact being behind your schedule, allowing for a certain percentage for contingencies, doesn't it really bring it up to 1939?

Sir M. Visvesvaraya.—Do you get more material with the " Kalu "? Are you using the " Kalu "?

A.—Yes, we are using the " Kalu ".

Sir Frederick Hopkinson.—Have you seen the statement of Mr. Neilson?

A.—I have.

Q.—Do you agree with it?

A.—I have only just glanced through it. There are several things about which I should like to consider further.

Q.—Perhaps we will see you again after Mr. Neilson has given evidence.

Q.—There are some things that I do not understand?

A.—The 1,600 hours he has taken I understand is the average of the number of hours that we have done each season?

Q.—I think it is what it has actually done and what it is likely to do in future.

Q.—There is something more in it—perhaps it is a typing error, for instance, that about 1 rupee a yard equals 4·14 brass. Then 4 lines lower he says Rs. 1½ per cubic yard or 4·14 brass?

A.—I think that is a mistake.

Q.—Some of these figures are very difficult to reconcile. (Reading from some typed matter.)

Q.—Can you give me an approximate idea what the cost is to run to for the dredging plant per year?

A.—The cost of dredging for one season is about Rs. 14·40 lakhs.

Sir Frederick Hopkinson.—I notice in Sir George Buchanan's estimate of 1919 he puts in 75 lakhs for the drains, etc.?

A.—Yes.

Q.—Had he anything to go upon for putting that in or is it a mere guess?

A.—I think he says the figure was supplied by the Public Works Department. Item 12 of his estimate, on page 29, " as per Government Public Works Department estimate, lump sum 75 lakhs ".

Q.—You have increased it to 212 lakhs?

A.—Yes.

Q.—You tripled it?

A.—Yes.

Q.—Have you told the Public Works Department what you did?

A.—No. There was no plan. Nobody knew what area was going to be .....

Q.—The Public Works Department didn't know?

A.—No.

Q.—Sir George Buchanan didn't know?

A.—No.

Q.—It was then a guess?

A.—It was a guess.

Q.—Although it is dignified by the name of an estimate.

Q.—As regards the dredging of the silting area, that was very important. If it will go on silting as fast as you dredge it, it will go on getting material indefinitely?

A.—Yes.

Q.—Is it not possible to make some check soundings in the next week or two?

A.—It depends on the weather.

Q.—I ask you if it is not possible to take some soundings?

A.—There is only a narrow channel near the Malabar Hill into which the boats can get in. We will try and do it.

Q.—It is very important and I want it.

Q.—Have you any idea how much material is available to be pumped from Back Bay?

A.—We have the quantity from the borings.

Q.—You have made borings?

A.—Yes.

Q.—Can you give me an idea of the quantity roughly?

A.—The Chief Engineer will be able to give it. I think one of Sir George Buchanan's reports gives the quantity.

Q.—How does he know?

A.—It was reported to him by Mr. Lewis, Chief Engineer.

Q.—Made so long ago as that?

Q.—If you turn to page 26, he says at present his intention is to take 19 million cubic yards from the harbour side (that is in February 1924) and 9 million cubic yards from Back Bay.

A.—Yes.

Q.—The question I asked you before was, can you tell me how much you have available in Back Bay?

A.—The figures arrived at are at page 36. The material available north of the cable is 7 million 345 thousand and the material south of the cable is 7 million 550 thousand cubic yards, making a total of 15 million cubic yards, although I understand from the Chief Engineer that that figure has since been revised on further borings Mr. Brims has made, and that figure is estimated at rather less than 15 millions.

Q.—I take it that that figure will give the quantity that you have approved, and that will be without the amount that silts up during monsoon.

A.—Yes, that is so.

Sir M. Vivesvaraya.—How far from the coast is that point where you dredge now with the Kalu?

A.—From three to four thousand feet from the line of the wall.

Q.—What would be the depth there at low tide?

A.—There will be only about 5 or 6 feet of water. That is why the dredger had to dredge its own flotation before it could remain there continuously.

Q.—I thought it was an advantage rather than otherwise?

A.—No, it was a great difficulty.

Mr. Billimoria.—Sir Lawless, I should very much like to know what you have to say with regard to the allegations made against your Department by Mr. K. F. Nariman. I take it that you deny the charges of fraud, jobbery, jugglery, levelled against your department by the Honourable Member of Council?

A.—I repudiate them absolutely.

Q.—Doubtless you are aware of the fact that the Government of India were very reluctant to embark on such an ambitious scheme?

A.—Yes, I have seen that in the previous papers.

Q.—Can you tell us, Sir Lawless, how and under what circumstances the Government of India and the Secretary of State were induced to sanction and approve the scheme?

A.—I have no further information beyond what is recorded in the correspondence, but I know that after the scheme had been sent up to the Government of India Sir George Buchanan was sent up to Delhi, I think, at the instance of the Bombay Government, and I understand he explained the details of his proposals to two representatives of the Public Works Department. What exactly took place, I do not know, but apparently the Government of India were satisfied that the scheme was a feasible one.

Q.—Do you know, Sir Lawless, that besides Sir George Buchanan, Mr. Monie, another official of the Bombay Government, met the Government of India and discussed the whole scheme before the same was approved or sanctioned?

A.—I knew that Sir George did, but I was not aware that Mr. Monie had gone.

Q.—The original estimate of Sir George Buchanan was 367·61 lakhs. Was that not so?

A.—Yes.

Q.—Based on that estimate the Government of India as well as the Secretary of State were induced to sanction the project?

A.—That is so.

Q.—At that figure it appealed to the Government of India as a practical scheme from an engineering point of view as well as from the financial point?

A.—Yes.

Q.—The scheme also appealed to the Bombay Government as having a reasonable prospect of being a productive one on those figures?

A.—It did.

Q.—In view of such belief I take it the Government of Bombay urged the Government of India to sanction the scheme?

A.—I think that is the inference.

Q.—Do you know from your personal knowledge if there was any urgent necessity for the immediate undertaking of the work?

A.—I do not.

Q.—In your evidence yesterday you stated that you had expressed your personal opinion and views in 1914 before the Bombay Development Committee that the development of the north of the island should take precedence over the Back Bay Reclamation. Do you still hold that opinion?

A.—I am still of that opinion.

Q.—When you were appointed Director of Development, I take it you very carefully studied Sir George Buchanan's estimate of the project?

A.—After I had been appointed I carefully studied it.

Q.—Did you express any opinion on it to the Government?

A.—No.

Q.—The estimate was prepared in May 1920 and sanctioned soon thereafter?

A.—The estimate was submitted by Sir George Buchanan in September 1919. It was sanctioned on the 4th May 1920.

Q.—At page 3 of your Report on the Working of the Development Directorate for the year 1922, you have got the paragraph, " Estimated Cost of the Reclamation ". It reads thus:—" In July 1921, in reply to a representation by the Indian Merchants' Chamber and Bureau (*vide* Press Note No. S.A.—3709, dated 20th September 1921) Government gave certain figures of the cost of the Back Bay Reclamation which showed that, assuming the adoption of Mr. Davidge's preliminary layout plan, Plate I, the cost of the land available for building, including interest throughout at 7 per cent. could, in June 1929, have amounted to just under Rs. 28 per square yard." That is your report?

A.—Yes.

Q.—On what data or materials or estimate was such cost worked out?

A.—It was worked out on the basis I think of Sir George Buchanan's estimate, but with an addition of about 10 per cent. The sanctioned project estimate had not by that time been prepared, but we were anticipating an excess. And for the purposes of the

reply to the Indian Merchants' Chamber Mr. Monie worked out certain figures based on Sir George Buchanan's estimate with what he thought would be a fair and safe addition to make. It did not come to 702 lakhs, but it was somewhere about that.

Q.—On the 18th July 1921 Mr. Monie wrote a letter to the Indian Merchants' Chamber in which he said Government did not expect to borrow from the public for any long period more than 4 crores for this 'particular scheme. And it was in September 1921 that Sir George Lloyd told the Indian Merchants' Chamber that the cost had been increased from 367 to 702 lakhs?

A.—Those are the dates. I do not think the reference to 4 crores being borrowed from the public was intended to mean the scheme was not going to cost more than that.

Q.—On the 14th March 1921 Sir Chimanlal Setalvad speaking on the scheme said in substance this: "The Government of Bombay put forward a scheme, but the Government of India turned it down, but after persistent efforts, the Government were able to induce the higher authorities to sanction the scheme which would cost 4 crores." This appears at page 10 of Mr. Manu Subedar's Report.

A.—Yes, I see.

Q.—Have you any opinion to offer on these remarks?

A.—Four crores was the round figure taken by the Bombay Government after allowing for an increase of about 10 per cent. on Sir George Buchanan's estimate. I think that in their letter of December 1919 the Government of Bombay told the Government of India that they were prepared to expect that there would be some increase owing to the increase of prices over Sir George Buchanan's estimate, and they would put it at about 4 crores. They said some words to that effect.

Q.—When you gave the information to the Indian Merchants' Chamber that the cost was not going to exceed Rs. 28 per square yard, was it based on the estimate of 4 crores or 7 crores?

A.—My idea is that it was based by Mr. Monie on intermediate figures. I cannot give it off-hand.

Q.—No material progress in respect of the scheme had been made before July 1921? The dredger had not arrived. No material progress was made as far as reclamation was concerned between May 1920 and July 1921.

A.—Yes, during the cold weather of 1920-21 a good deal of preliminary work was done in getting the quarry ready.

Q.—If the work actually started in January 1921 and the scheme sanctioned in 1920, what were the circumstances that led to the estimates being doubled in such a short space? How was the estimate practically doubled during the next few months?

A.—Sir George Buchanan's estimate was prepared in 1919 and he based it on the prices ruling at that time and the expectations on that date. The sanctioned project estimate was prepared in 1922.

Q.—When you gave the information to the Indian Merchants' Chamber in 1921 you have stated the figure of 7 crores?

(*Chairman.*—In point of fact the history of this increase is this, that almost as soon as the Development Department was created questions arose as to whether the estimate 367 lakhs was any way near the mark, and almost immediately you and your staff began to look into the figures, and certainly by September 1921 Sir George Lloyd was in possession of the figure 702 lakhs, because he stated it at the meeting of the Indian Merchants' Chamber in September.)

Q.—Will you kindly let us know what were the circumstances that led to the estimates being doubled within such a short space of a few months? Work had not practically commenced except the preliminaries?

A.—It happened because since Sir George Buchanan had prepared his estimate the prices of stores, plant and material of all kinds, wages, fuel, had gone up considerably and also on account of the exchange. Sir George Buchanan based it on Rs. 12 to the pound, and when plant was being imported exchange was in the neighbourhood of Rs. 15 to the pound. We found, estimating at the rate we would have to pay in the future, based on the rates prevailing on the date of the project estimate, that to do the work Sir George Buchanan proposed should be done would cost 702 lakhs. So practically there was an increase of 75 per cent.

Q.—Then your estimate of cost of Rs. 28 per square yard must be increased by Rs. 21.

A.—The estimate of Rs. 28 was made on the basis of 7 crores. It was not an estimate worked out by the Engineers or by ourselves. It was worked out by Mr. Monie as Secretary of the Development Department for the purpose of this announcement of Sir George Lloyd to the Indian Merchants' Chamber. I think I have got in my office details as to how he arrived at that figure.

Q.—Did you inform the Government of India and the Secretary of State of this vital increase in the estimate from 367 to 702 within the space of 7 or 8 months?

A.—I informed the Government of Bombay at once.

Q.—Do you know if the Government of Bombay communicated it to the Government of India. Have you any knowledge?

A.—No. But at that time the Government of Bombay were in a position to sanction the estimates themselves under the Reforms Scheme.

Q.—During this period up to 1921 the dredger had not arrived, nor had any operations been commenced, and still the estimates of the general cost had gone up by 75 per cent. irrespective of the failure of the dredger?

A.—The estimate simply provided for the scheme as set out in Sir George Buchanan's estimate, and we took it that the output of the plant would be the same as he estimated. It was merely a revision of his estimate to bring it in accord with the prices which had altered. We only had the specification of the dredger at that time. The estimate had been accepted by the Government and the Government of India, and we took the same figures of output as Sir George Buchanan.

Mr. S. B. Billimoria.—Did you, as administrative head of the department, not think it necessary to bring to the notice of the Government of India, the changed conditions which would affect the estimate?

A.—I kept the Government of Bombay informed of everything.

Q.—The scheme was sanctioned by the Government of India with the approval of the Secretary of State?

A.—The second scheme of 702 lakhs was sanctioned by the Government of Bombay.

Q.—You informed the Government of Bombay and you thought you had done your duty?

A.—Yes, I had done my duty.

Q.—How and under what circumstances was the estimate passed by the department in May 1922? There has been a change, isn't it? There were various estimates prepared. Was not there one in May 1922?

A.—I have got it. May 1922, that was the detailed project estimate of 702 lakhs. It was submitted by the Chief Engineer in May 1922 and sanctioned by the Government of Bombay in October 1922.

Q.—So you were quite correct about the estimate of 1922, absolutely certain?

A.—Yes, so far as it was a revision of Sir George Buchanan's estimate.

Q.—How did it immediately jump up to 11 crores soon thereafter? If you were so sure of your subsequent estimate of 7 crores. How did it jump up to 11 crores?

A.—I have tried to explain that in the statement submitted to the Committee. The estimate of 7 crores would not have been exceeded if the output of the dredger in terms of consolidated filling had been 5 million cubic yards, and if the whole of the material could have been obtained from the harbour. If those expectations of Sir George Buchanan had been fulfilled, I estimate roughly that we should have a saving of 30 lakhs on the sanctioned project estimate of 702 lakhs. It is on account mainly of the deficiency in the output of the dredger and partly also owing to the necessity of pumping in Back Bay that the estimate has been exceeded. But that estimate of 11 crores was based on the output in the year 1924-25. The figure will of course not be that when a fresh estimate is made (which has not yet been made) based on the experience of last season.

Sir M. Visvesvaraya.—Which would be more favourable?

A.—Yes.

Mr. Billimoria.—You have made some 6 or 7 estimates?

A.—We made 4 and Sir George Buchanan has made 2.

Q.—None of these estimates had come out true? They are all out of the mark?

A.—The only estimate that has been sanctioned is the official sanctioned project estimate. No action has been taken on others.

Chairman.—As regards the 702 estimate you kept close to the building of the wall. In fact, you did not spend as much on that as you anticipated?

A.—The saving was mainly due to the reduction in the amount of concrete. Even if that had not been done we should have worked very closely to the estimate, in respect of the wall.

Q.—The reasons why your figures did not prove to be true as regards the dredging are given at page 8, paragraph 5 of your statement before us?

A.—Yes.

Mr. Billimoria.—So you attribute the failure to dredging and the estimate going up from 7 to 11 owing to the failure in dredging?

A.—Solely to dredging and nothing else.

Q.—Beyond furnishing this information of the estimates having materially varied to the Advisory Committee, you did not think it advisable to take the public into your confidence?

A.—The information about the actual filling in the season 1924-25, which was the season Sir George Buchanan advised the Government to wait for before coming to a conclusion, was given by the Chief Engineer on the 17th of July 1925. It was immediately communicated to the Advisory Committee and to their Sub-committee and it was also immediately communicated to Government and to Messrs. Meik and Buchanan. It was considered by Government at a special conference that was held in Poona, and it was decided to write a letter at once to Sir George Buchanan—a copy of the letter is printed amongst these papers. It was also decided that no further action could very well be taken as the matter was under the consideration of the Advisory Committee and that their report should be awaited, and their report should be given to the public as soon as possible immediately Government received it. It was thought that it was not much good our trying to work out separate conclusions as the Advisory Committee were doing it themselves and had also got some way with it. In any case, if any information was to be conveyed to the public, the Director of Development could not take the responsibility himself. The Government of Bombay would give such information.

Q.—All that information that the public would get through the head of the Government of Bombay would be through the responsible head of the department?

A.—A press note is issued over the signature of the Secretary to Government or in the alternative the Honourable Member makes a statement in Council if it happens to be sitting.

Q.—In view of this did you not think it advisable to suspend the project until further investigation was made?

A.—We did arrange at once to suspend the work on the sea wall and all the storm-water drains; except those which were concerned with the completion of blocks 1, 2 and 8, everything else was stopped.

Q.—If you won't take any affront on my remarks I will put to you a personal question, that you as the administrative head of such a large department were dealing with public finance, would it not amount to careless indifference, if not criminal negligence, to keep the public in the dark as to the true state of affairs?

A.—I don't think that it has ever been my business as Director, as the head of the executive part of the Development Department, to communicate to the public on questions which involve matters of policy. I have always understood that this was a matter for Government. I would issue any information of Government wished me to. I was to keep Government fully supplied with information, and they would decide what to do in the way of publication themselves. My business has always been from the beginning to try and get the work done.

Q.—Yes, Sir Lawless, but you have issued, I take it, about 6 reports?

A.—These are reports that give information to public. They give information about the progress of the work as an engineering work only.

Supposing you were a managing director of a Joint Stock Company and kept back such material information from the knowledge of the shareholders of that company you know that you would run the risk of legal proceedings against you. Isn't that so?

Chairman.—Are you sufficiently acquainted with the section of the Companies Acts?

A.—I am not.

Mr. Billimoria.—I suppose it is every day common knowledge that if a director misbehaves, does not give material information to the shareholders he is legally responsible for his action. That is I suppose common knowledge of every one?

A.—When Government were in possession of the full information about what was going on I could not take the responsibility myself of giving any information to the public.

Q.—So you want to throw the entire blame on the Government of Bombay as far as you are concerned?

A.—No. My point is that having given full information to the best of my ability, I do not think any information was withheld from the public on the grounds that I had failed to supply it.

Q.—Taking your reports on the working of the department from year end to year end we find the happy phrase " steady progress " noticeable in every report of yours. What do you mean by " steady progress "? Year after year you find statements made " steady progress ". 1921-22 has been marked by " steady progress ". In 1923 you say " During the year 1922-23 the work of the Directorate proceeded smoothly " and according to programme. Generally speaking, the policy adopted is to push the reclamation. This was March 1923?

A.—Yes.

Q.—You have the same in 1924. You say, the reclamation and housing schemes made satisfactory progress. In 1925, in your report you say " work on the Back Bay Reclamation Scheme and Housing Scheme made steady progress during the year "?

A.—Yes.

Q.—What do you mean by this " steady progress " when you knew that the work was very unsatisfactory : the dredgers had failed, your estimates had gone up almost double the amount estimated. What do you mean by informing the public that the progress was steady?

A.—What we knew was that the progress on the construction of the sea wall was going on satisfactorily and the dredgers were working, though we knew that in the first season the output had been very much lower than Sir George Buchanan estimated it to be. But he satisfied Government that the first year's working should not be taken to be a criterion and that no conclusions should be based on it, and Government agreed that the results of the season 1923-24 should be awaited. The first season was treated more or less as experimental, a sort of trial one, and I do not think it would have been a sound proposal to go and issue alarmist reports about the state of affairs at that stage. If the directors of an industrial concern such as you referred to just now, when they were having a trial run of their machinery were to find that things were not working smoothly, I do not think they issue alarmist reports, I think they would prefer to await a further trial.

Chairman.—They have got to steer a middle course. There should be no suppression of material points. On the other hand, they must not create panic by making frightening statements?

A.—I am quite sure that I could have made statements in these reports, but I am quite sure that I should have been taken to task by the Government for doing so and certainly by Sir George Buchanan.

Q.—It was that fear that prompted you of getting blame from Sir George Buchanan?

A.—No question of fear at all, but I felt that the position was difficult and that Government had to decide between prematurely, if one may put it that way, causing a panic and perhaps unnecessarily doing it. There was no reason to believe that Sir George Buchanan's expectations might not be fulfilled, and in the second or third year when the staff had got more into the way of the working of the dredgers that the results might have been very much better.

Q.—We shall accept that explanation of yours. But in the light of what has turned out the statements made in your reports are not absolutely accurate. Isn't that so?

A.—I would not be prepared to agree with that. It is simply a record of the progress of the work.

Chairman.—Would you be prepared to agree that so far as your statements go they are accurate, but there are material omissions?

A.—Yes.

Mr. Billimoria.—Would such omissions mislead the public?

A.—It is just a question, that it is quite possible that if information had been given at that time it might have misled the public.

Q.—You mean the supplying of correct information?

A.—It would have misled the public to believe that the output would never be better than it was in the first year because my statements show that it has very materially improved. In the first year, the actual reclamation done was only 5 lakhs cubic yards. If the public were informed that that was all that was going to be done it would certainly have created a false impression.

Q.—May I take you through the 5 reports that you have published. The 6th one was handed to me in the morning. If you will kindly refer to the report of 31st March 1921, which we shall call the first report, you refer to the appointment of Mr. Lewis as the Chief Engineer?

A.—Yes.

Q.—I take it that he was a nominee of Sir George Buchanan. His salary was paid by your department, that is by Government. What was the responsibility of the nominee. If he was your employee, and a mere nominee of Sir George Buchanan, to whom was he responsible? Sir George Buchanan?

A.—He was to carry out the work under the instructions of Messrs. Meik and Buchanan, but he was an employee of the Bombay Government, he was to take instructions on technical matters from Messrs. Meik and Buchanan who had been appointed the Engineers by the Secretary of State for carrying out the scheme.

Q.—He was serving two masters, he did not know whom to please?

A.—He was under Government from the administrative point of view. On technical questions he was responsible to Messrs. Meik and Buchanan.

Chairman.—There was nobody in the Bombay Government or in the Development Directorate who had any knowledge of giving any single engineering order to Mr. Lewis?

A.—No.

Q.—Mr. Lewis was nominated by Sir George Buchanan as a fit and proper man to carry out this highly technical engineering work under Sir George Buchanan's contract?

A.—Yes.

Mr. Billimoria.—If anything went wrong, it was Mr. Lewis who would be responsible and not you or the Government of Bombay?

A.—No, I take it to be Messrs. Meik and Buchanan.

Q.—Supposing Mr. Lewis did not carry out their orders or instructions?

A.—But he did. We had all the correspondence that passed between Mr. Lewis and Messrs. Meik and Buchanan. It all passed through my office. Copies of all correspondence were filed in my office simply that I might satisfy myself that the Chief Engineer was doing exactly what Messrs. Meik and Buchanan wished done.

Q.—So it is Sir George Buchanan who comes in for blame and not Government.

A.—The firm were appointed Engineers to the scheme. When you appoint Engineers to do a scheme and they have estimated and it does not work out according to the estimate.....

Q.—It has gone hopelessly wrong?

A.—Suppose it goes hopelessly wrong, who is responsible?

Q.—I am asking you who is responsible?

A.—I think the Engineers.

Sir M. Visvesvaraya.—If you say that Messrs. Meik and Buchanan are responsible for the work, why did you change the estimate from 4 crores to 702 lakhs without their knowledge or consent?

A.—There was no alteration in the works. The estimate merely gives the cost of the work.

Q.—But you had smaller items?

A.—No, it was a question of altering rates.

Chairman.—On the 11th of February 1922 Sir George Buchanan assented to the alteration of rates and he put the total figure at 666 lakhs?

A.—The increase in prices had occurred in the interval.

Mr. Billimoria.—He recognised that there was an increase in the estimate?

A.—Yes.

Sir M. Visvesvaraya.—What is the extent of responsibility of a technical adviser? He is not responsible either for progress or for costs. You are responsible for both. He was not supervising the progress of work from week to week. The expenditure is all audited by Government?

A.—I think the agreement says the work is to be closely supervised by Messrs. Meik and Buchanan.

Mr. S. B. Billimoria.—You deal with expenditure. You deal with purchase of materials locally. They are only to advise you about the technical side of the work?

A.—Yes.

Q.—The detailed plans and estimates were supplied, but they won't be responsible for the progress of the work or the cost of the work or the growth of the work?

A.—No. They are not consulting engineers.

Q.—They are making their reports to you and not the Government of Bombay?

A.—Their Reports are submitted to the Government of Bombay by me.

Chairman.—The fact is that the Government of Bombay presented Mr. Kidd's scheme to Sir George Buchanan. One of the questions that was specifically asked was, what the cost of the work would be. Sir George Buchanan estimated it at 367 and then subsequently by the 11th February 1922 had increased it to 667 lakhs and had given at page 10 of his report reasons as to why the original estimate of 367 had failed. So he did accept undoubtedly responsibility for the original sum of 367, and he was prepared to allow it to go without any dissent on his part to 666 lakhs.

Sir M. Visvesvaraya.—The Engineers give professional advice but they have no responsibility for the expenditure. The responsibility must rest either with the Director or with the Government of Bombay?

A.—The Government of Bombay sanctioned the estimate.

Q.—They work through you?

A.—Yes, but Meik and Buchanan are to carry out the work.

Q.—The local directorate carries out the work and is responsible for the expenditure. The technical advisers took no responsibility for the progress of the work or for the expenditure? They advise at every stage.

Chairman.—That depends on the construction of the document. When he was described as Consulting Engineer, Sir George Buchanan's assertion was "I am nothing of the sort". He wrote a letter to say there appears to be a misunderstanding. We are not consulting engineers. We are the actual responsible engineers.

Sir M. Visvesvaraya.—That is their assertion, but it has not been accepted by Government?

A.—Of course.

Chairman.—Of course, it was. They said they would put the scheme through. "We are the responsible officers".

Sir M. Visvesvaraya.—It is very unusual that you should throw the blame on Sir George Buchanan or the firm for the progress of the expenditure. You spent the money. The Chief Engineer is under your orders and you are responsible to Government. They are the technical advisers at every stage. They may have said they are responsible, but that means very little.

Chairman.—It must depend on the true construction of the contract. There is the contract. There are the engagements that Sir George Buchanan entered into. They may be unusual agreements for an engineer to enter into, and the question is whether Sir Lawless was not right when he said that the actual execution of the work together with the estimate of cost were matters for which Sir George Buchanan was solely responsible.

Sir M. Visvesvaraya.—What guarantee is there for the fulfilment of his responsibility to Government.

Chairman.—I suppose only the guarantee of his reputation and previous experience.

A.—I have always understood that the contract had been made with Messrs. Meik and Buchanan, and when I saw the question was discussed of my becoming Director of Development I naturally said I knew nothing about dredgers or dredging. So far as reclamation was concerned that work was put in charge and under the control of an expert firm of engineers who would take over and do this work as Engineers of Government.

Q.—What hold have you on the firm if anything went wrong? What hold has Government on them? The firm has only a few years' standing?

A.—I do not want to throw responsibility on them but I think I am entitled to point to the agreement which is a fairly definite agreement stating exactly what the position of the firm of Messrs. Meik and Buchanan in relation to the Bombay Government.

(The Committee reassembled after lunch and the examination of Sir Lawless Hepper continued.)

Mr. Billimoria.—In your evidence, Sir Lawless, you have stated to us that Mr. Lewis had some previous experience of reclamation work somewhere?

A.—Sir George Buchanan told us so at the time.

Q.—It was not your personal knowledge?

A.—I only knew that Sir George Buchanan nominated him to this post. It was one of the recommendations when he put forward his name that he had been employed on the reclamation by dredging in Mesopotamia.

Q.—Had he any knowledge or experience of local conditions?

A.—He belonged to the Burma Public Works Department and I think he was employed in Burma for the most of his life but he was for some time on the Imperial City work at Delhi; I am not certain about it.

Q.—Then he had no experience of reclamation?

A.—Except that he has had in Mesopotamia and possibly in Rangoon.

Q.—Do you think he had sufficient experience or capabilities for undertaking such a huge work particularly of reclamation in an open sea front?

A.—I think he had.

Q.—You have stated that he was not under your direction or guidance but was responsible to Sir George Buchanan. I take it, this was so?

A.—In technical matters he was under Sir George Buchanan's instructions.

Q.—Do you know if he was familiar with conditions of labour and the material required for the reclamation?

A.—Yes, he was.

Q.—Did you ever consider the question that this reclamation was responsible for washing off the foreshore of Bombay, at Chaupatti, the Mahim shore and Juhu? Did you ever consider this point?

A.—I know that it has been suggested that a certain amount of enrodes that took place in Chaupati was due to it but during the monsoon of 1924 there was a very heavy storm which happened to synchronise with very high tides at the end of July and the temporary railway track on the sea wall of the reclamation was washed off and a certain amount of damage was done to the Municipal protection works on the Chaupatti shore and it was suggested then that that action of the sea had been accentuated on account

of the reclamation works but we did not think so. We find in previous years that there had often been damage and there was nothing that we can find to show that the construction of the sea wall had in any way aggravated that.

Q.—What about the washing off, of the foreshore of Juhu? Was that due to the reclamation works or due to natural conditions?

A.—It has been suggested that it was due to the Back Bay Reclamation but I cannot conceive it is.

Q.—Before this reclamation was undertaken, did you ever notice that the Mahim shore or Juhu shore was washed off to the extent it has been washed off at present?

A.—The Juhu foreshore was being enroded for the last 25 years and it is believed to be due to the selling of the sand on the foreshore. Thousands of cart loads of sand was taken away from the shore. It was pointed out that the sand was a natural protection of that shore and if the people were allowed to take away the sand, there were chances of their property being washed away. This has been stopped now but I think that was the main cause rather than the reclamation works.

Q.—Did you ever consider the question of the health of the citizens of Bombay? Whether that would be in any way endangered by this reclamation?

A.—It was considered, and in order to reassure public opinion, Government appointed a very strong Sanitary Committee at the very outset which, from the beginning, have been watching conditions in the reclamation area and on their recommendations, we have appointed an expert officer of the Medical Department who has specialised in anti-malarial work, and he has been extremely useful in preventing malaria. The figures of admission to the military hospital in Colaba show that since the reclamation works began, there has been a considerable reduction in the admissions on account of malaria.

Q.—Previous experience of reclaimed area at the Ballard Estate is different. When the Port Trust undertook the reclamation of the Ballard Estate, Bombay was infected with malaria for a number of years?

A.—I understand that that was due to the open excavation of the Alexandra Docks. There was a very large excavation and naturally there were large pools of water lying about and it was this excavation that the malaria came from and not from the reclamation works.

Q.—So there is no danger, in your opinion, with regard to the health of the City of Bombay if this reclamation work is carried on?

A.—In 1914 when this reclamation scheme was before the Government, Mr. Mackieson, who was the Chief Engineer of the Bombay Municipality, stated that he thought that the reclamation, if completed, will have a very beneficial effect on the climate of the fort in Bombay and on the health of the people on account of the foreshore, which breeds mosquitoes between spring and neep tides, being covered up with earth.

Q.—That is a very satisfactory explanation.

A.—The published reports of the Sanitary Committee, which are published every year with my report, show clearly that the incidence of malaria in Colaba has been reduced from the admission rate of about 900 per thousand since the work was started to something like 200 per thousand.

Q.—Now I shall turn to your Report for the year ending 31st March 1921. I am sorry I have to take you over the same ground which has been traversed by our worthy Chairman but I think it will lead to clearer understanding.

At page 3 at the end of paragraph 9, you say " The dredger is timed to arrive in Bombay after the monsoon of 1922 when it is expected to have a compartment of the reclamation area ready for filling ". Did you realise this?

A.—We did not.

Q.—Any reasons for your not realising it?

A.—The reason was unexpected difficulties in completing railways from Marine Lines down to Colaba and in laying the sidings which had to be constructed there at the time before working could be started. There was also a very small strip of foreshore on which we could commence our operations. We had practically to reclaim the land we wanted to put our sidings on because the whole of the Colaba area belongs to the Military Department and we were not able to encroach on their land to any very great extent and in these circumstances it became necessary to reclaim the area from the sea that we wanted. As a result of these difficulties, which we did not foresee, we could not get a compartment ready until the beginning of the season in 1923-24.

Q.—You did not anticipate these difficulties when you submitted this report?

A.—The Chief Engineer did not think at that time that he anticipated any difficulty.

Q.—If you turn to page 8 of this report, some mention seems to have been made at paragraph 32 about Advisory Committees. How often do these committees meet?

A.—They met about once a month.

Q.—How often had you any occasion to consult the Committee? Did any matters arise where you had any reason to consult these Committees?

A.—There were numerous matters specially in the early years which were referred for their opinion but they were mostly questions connected with Housing Schemes and Suburban schemes.

Q.—The Advisory Committee complain that they were not consulted on very important and vital points. They were absolutely disregarded. Is that a fact?

A.—That complaint is absolutely unfounded. The Advisory Committees were appointed to advise Government on any points which Government might refer to them and also they were to discuss any question which any member of the Advisory Committee was to bring forward.

Q.—Did you ever discuss the financial position with any of the members of the Committee? They were all businessmen such as Representatives of the Municipal Corporation, the City Improvement Trust, the Chamber of Commerce, the Millowners' Association and the Indian Merchants' Chamber.

A.—I have not got the actual terms of the Government notification appointing Advisory Committees but the Advisory Committees were actually appointed to advise Government as to the progress of the work such as suburban schemes, for instance, to take over a small piece of land and develop it. The scheme was worked out and it was put before them and the possibility of the sale of land, which Government might expect, were discussed with them and sometimes the schemes were modified in accordance with their wishes and generally they were asked to give their opinion on them.

Q.—Did any member of this Committee ever complain to you or your Department that the information they wanted was not supplied?

A.—Not to my knowledge.

Q.—So all the facts were disclosed to them?

A.—There was a case in the Advisory Committee (afterwards it became a special committee later on). I do not know if you are referring to that. In the earlier stage, I have no recollection.

Q.—Did any member resign out of resentment?

A.—Mr. Manmohandas Ramji resigned. He was the representative of the Indian Merchants' Bureau. I have no information as to why he resigned.

Q.—Did you enquire why a representative of a public body resigned from the Advisory Committee?

A.—As a matter of fact, though it is not definite, I understood at the time that he resigned because the views that he held did not exactly correspond with those of the Chamber he was representing.

Q.—It was only because of the difference of opinion?

A.—That is what I understood at the time.

Q.—Not because of any treatment or because of suppression of facts on the part of Government?

A.—It was never stated.

Q.—Now I shall come to your Report for the year ending 31st March 1922. On page 1, as I have already said, there appears that happy phrase ' steady progress '. You explained something this morning, but would not anyone reading this report infer that the progress referred to was in accordance with the estimate and that everything was all right as far as the works are concerned?

A.—The progress of the work was satisfactory at the time.

Q.—During the period covered by this report, the dredger and plant had not arrived in Bombay?

A.—It arrived on the very last day.

Q.—But it had not been worked?

A.—No.

Q.—Supposing you undertake a small contract which was designed to be completed within say a lakh of rupees and the period estimated for the completion was one year. After having spent most of this amount and having already run out half the amount that you require for the whole scheme, would you call that steady progress. The work may have progressed but not in proportion to the estimates.

A.—I think the question probably refers to the next report. In this report there has been no dredging progress. The dredger did not start working for 7 or 8 months after this.

Q.—What do you mean by suggesting here that the various schemes referred to in the last report have been successfully launched? Has that any reference to the reclamation scheme or to the Housing Schemes?

A.—It refers to all schemes which were referred to in the previous report.

Q.—You said this morning that detailed estimates having been completed at the rate of Rs. 28 per square yard, this rate is not likely to be exceeded. This is also referred to on page 3 of your report for the year 1922. Were you definite about it at the time?

A.—I said this morning that I would send the calculations on which this rate of Rs. 28 is based.

Mr. Billimoria.—If you read a few sentences further, you will find it stated " On the contrary, the probability is that the actual figure will be less, because the calculation by which Rs. 28 per square yard was arrived at took no account of the possible sales of land prior to 1929." You expected the whole scheme to be completed by 1929?

A.—That was the date it was expected to be completed in the original scheme and the forecast on which this was based provided the sale of land will begin until the whole scheme was completed but it was not possible to have the whole of the reclamation done.

Q.—If a part of the reclamation had been done and the land sold before the completion of the whole scheme, it would have the effect of helping to reduce the cost of the land. If you had not started to build the wall on both ends and had confined your attention to completing one part, you would, by now, have been in a happy position to sell some part of the land.

A.—The building of the wall has not interfered with the progress of reclamation. The building of the wall at Colaba has been as rapid as possible. Preference was always given to the construction of that wall over the question of building the wall at Marine Lines. The construction of the wall at Marine Lines was treated as subsidiary.

Q.—If you will kindly read a sentence further, you say " it is expected, however, that land will be available for sale before that date..... ". It meant before 1929?

A.—Yes.

Q.—We are practically at the end of the year 1926 and we see no signs of any block of land being ready?

A.—That is perfectly correct, but if the dredger had dredged 5 million cubic yards of material per season then by the end of 1929 it would have been ready.

Q.—The whole fault lies with the dredger?

A.—Yes, with the output of the dredger.

Q.—In your Report for the year ending 1921, paragraph 8, you say that 2,000 feet of the wall at Colaba will be ready before the next season, that is 1921-22. Further you say " At Colaba arrangements are not so far advanced, but it is hoped that a 2,000 feet length of wall of a special design will be completed." If you refer to page 6 of your Report for year ending 1922, you repeat the same story; it is hoped that the progress of the work will not be seriously interrupted by the monsoon and that section of 2,000 feet will be completed before the commencement of the next working season. From year to year, it is mere hope and expectation.

A.—I have already explained that the work at Colaba was delayed owing to unforeseen difficulties in connection with the construction of the railways. At the time the first Report was written, it was hoped that 2,000 feet of the wall at Colaba would be constructed much earlier than has been the case. As a result of these difficulties in connection with the railway, the actual construction was postponed beyond the date that we hoped.

Q.—If you look back on page 6 of the Report, you talk of dredger and say that the dredger is capable of dredging 2,000 cubic yards of clay per hour from a depth of 70 feet below water level and delivering the same through 5,000 feet of pipe line.

A.—That is the specification. That is Sir George Buchanan's report that the dredger will be capable of doing so much.

Q.—Your experience is to the contrary?

A.—We had no experience at the time.

Mr. S. B. Billimoria.—In your evidence here, you stated the clay was heavy. I do not quite clearly understand it. You stated that the clay was not what you expected it to be?

A.—If you send a man to dig in a garden and the earth is very light he would take a certain amount, but if you send him to dig earth from stiff, hard and heavy soil it is certain to be found that he will not produce the same output. It depends on the class of material in which the dredger is called upon to work.

Q.—You found that the material was not satisfactory?

A.—It is very satisfactory for purposes of reclamation, but it is not of a class which is conducive to high output or the specified output.

Q.—But the dredger was specially designed for a particular class of material and a particular output?

A.—It was designed for an output of 2,000 cubic yards per hour of soft clay. Our contention is that a great deal of it is which cannot be described as soft clay.

Sir Frederick Hopkinson.—I want to know what you call hard clay. You found hard clay ?

A.—I have certainly seen hard clay.

Q.—Hard and soft are relative terms. What is the definition, where does soft begin and hard end ? I think you will find it very difficult to give ?

A.—I regard clay as hard when the clay is so hard that the dredger has difficulty in cutting it. I understand that the dredger had difficulty in cutting it.

Q.—Slowed up the cutter ?

A.—Yes.

Q.—That may not be due to hardness ? It may be due to cutter. If you put the cutter with too big a face that alone will slow it down.

A.—I made my statement on what my engineers reported and the engineers themselves would be able to give much better detail.

Sir M. Visvesvaraya.—Let us see the " Sir George Lloyd ".

A.—Certainly, any time.

Mr. Billimoria.—Did you bring this to the notice of anyone that the clay was different from what was anticipated ?

A.—Messrs. Meik and Buchanan were informed.

Q.—Is East Colaba work now absolutely suspended ?

A.—Yes.

Q.—We shall not trouble you about that as it does not concern the present enquiry ?

Sir M. Visvesvaraya.—No expenditure has been incurred ? That is all gone ?

A.—It is not gone. Some of it is on land, etc.

Mr. Billimoria.—Have you reclaimed any land in East Colaba ?

A.—We acquired some land and we can sell it.

Q.—At what rate did you acquire it ?

A.—I cannot give the figures off hand, but I can give the total expenditure on the East Colaba with full details.

Q.—Do you hope to recoup all the expenditure, up to what percentage ?

A.—I prefer to show the figures of expenditure and then it is just a question of what might reasonably be expected to be recouped by the sale of the land.

Sir M. Visvesvaraya.—Is this included in the 702 lakhs ?

A.—No.

Mr. Billimoria.—We shall turn to your report for the year 1923. Same observation as in the previous year with regard to the progress of the work which you have now explained. But here you go further and say " for practical purposes according to the programme ". Would not that lead one to infer that that was within the estimate, if you say " according to programme " ?

A.—I do not think so.

Q.—You don't think it is an incorrect statement ?

A.—I should like to see the context. Where is it to be found ?

Q.—The very first page " during the year 1922-23 the work proceeded smoothly....." This gives a very rosy picture to the public, at the end of the year 1923, third year completed ?

A.—You realise that the dredgers did not begin dredging until December 1923. Up to this date there was no question of dredging.

Q.—What are the " practical purposes according to programme " ?

A.—The works covered by this were the construction of the wall and the opening out of the quarry and the construction of railway and it also refers to housing schemes and all schemes of the Development Department.

Q.—Had you any definite programme, this in 1921, this in 1922, 1923 ?

A.—We had a programme which is attached to the sanctioned project estimate. There is a programme showing every year how much work is going to be done, also a programme for construction and for housing scheme. According to this, this programme was being worked to.

Chairman.—The Back Bay Reclamation was not worked according to this programme. Take one instance. You said that you hoped in October 1922 to have an enclosed area for the dredger to operate in ?

A.—Yes.

Q.—In March 1923 you were writing that the work had gone " according to programme." There was no enclosed area for the dredger to work in. It was lying idle for month after month ?

A.—Yes. So far it was wrong.

Mr. Billimoria.—When did you first entertain any doubts as to the success of the scheme ?

A.—After the first year's dredging.

Q.—That is in 1924 ?
A.—Yes.

Q.—When did you first ascertain that it was not practicable to work within the estimate of Sir George Buchanan ?

A.—I had misgivings about it in 1924. But it was agreed that the complete working season of 1924-25 should be awaited before any conclusions were formed, and as a result of that working season I naturally came to the conclusion that Sir George Buchanan's expectations could not be achieved.

Q.—That was in 1925 ?
A.—1925.

Q.—Did you entertain doubts earlier ?
A.—I entertained doubts in 1924.

Q.—Did you take any steps to remedy the defect or bring it to the notice of Government ?

A.—I brought it to the notice of Government at once and of Messrs. Meik and Buchanan, and they represented, as I have already said, that the work of the first season ought to be regarded as experimental and that it would not be right to base conclusions on the results of the first year. They said " give it another chance. Wait for the season of 1924-25 and you will see that you will do very much better because many things have occurred in the first season which will not occur again ".

Q.—It may be giving as it were a long rope ?
A.—Give it another chance to see if it could not do better under better conditions.

Q.—In your report for 1923, March, you talk of detailed project estimate amounting to Rs. 7,02,43,321 sanctioned by Government in October 1922, and say that it was the same as supplied to the Indian Merchants' Chamber. You go a little further and say the figure is exactly the same as that on which the information supplied to the Indian Merchants' Chamber in September 1921 was based. " There is therefore no further change in the previous forecast of cost per square yard. Much depends on the time required for the execution of the project, and as to this all that can be said at present is that the indications are that a somewhat shorter period will be needed than was at first estimated." What are the indications ?

A.—The indications were that the wall was ahead of the programme, and in the absence of any practical experience of the working of the dredger it looked as if there were some chance of getting the work done possibly sooner.

Q.—Did you at any stage inform the Merchants' Chamber that the original estimate was 367 lakhs ?

A.—I think that was published at the time the information was given to the Indian Merchants' Chamber.

Q.—You talk of 702 lakhs ?.
A.—That was the sanctioned project estimate.

Q.—You make no mention of the 367 lakhs or the 4 crores figure stated by His Excellency the Governor.

A.—No. I do not think there was any. Everybody, I think, knew that the previous estimate was 4 crores or 367 lakhs. I don't think there was any concealment about that.

Q.—We shall turn to your report for 1924. There you say, " Filling commenced in December 1923, and the reclamation made satisfactory progress. (The very first paragraph) " The reclamation and housing schemes made satisfactory progress ". The dredger had been pumping in December 1923. Did you find the dredger working satisfactorily between December and March, a period of 4 months ?

A.—The actual output of 5 lakhs odd in that season was known some time in July and this report was of course drafted before that, but still we had the weekly records and we knew at that time that the results were not so satisfactory.

Q.—You had known it at that time ?
A.—We knew the figures for 1923-24.

Q.—That the results were not satisfactory ?
A.—We had not the actual figure until July.

Q.—The report is said to be published " to 31st March " ?
A.—It is generally issued in June.

Q.—There is no indication as to when it was issued ?

Q.—You mean that when this report went out you had no knowledge. You knew about it later ?

A.—We knew it was not anything like 5 million cubic yards.

Q.—For 4 months it was 5 lakhs. So for 12 months it would be 15 lakhs as against 50. That would only make 10 lakhs against 50 lakhs ?
A.—Yes.

Q.—That would not be satisfactory at all from any point of view?

A.—No. I have explained that these reports have been very difficult to frame on that account. It would have been quite possible to put in this report that only about 5 lakhs of cubic yards had been pumped and that at that rate reclamation would not be completed for fifty years and the life of the dredging plant being twenty years a second dredging plant would have to be bought, and the life of the pipe lines being eight years, these would have to be renewed several times, and I would have had to make an alarming story about it.

Chairman.—Which would have been truer?

A.—I think the results of last year would have been more correct.

Q.—But at the date of the report which should have been the more correct, to set out all the disappointing features or to conceal them?

A.—To set them out undoubtedly. But I had to consider the policy of the matter.

Mr. Billimoria.—With regard to that policy, are you prepared to shoulder the sole responsibility and not shift it on to Government?

A.—I am quite prepared to accept the responsibility for not having issued information of that kind in my report.

Q.—The Honourable Member in charge of the Department had nothing to do with that report? He had the full report?

A.—No. He never saw it. The Government had the information about the results of the dredger. That was after full discussion between Government and Sir George Buchanan.

Q.—Government did not instruct you to issue any report of this nature. As it is in my hands at present, not indicating the true results?

A.—This is the form in which it has always been issued and Government never drew my attention that it was in any way deficient, and I think it was reasonable for me to assume that if Government considered it desirable to issue any information that was not in my report I should be instructed to do so, or Government would do it themselves.

Q.—Is it not always left to the head of the department to draft his own report? It is generally left to the administrative heads of departments. His Excellency does not go into the details of all the work of the presidency. Reports are submitted to him. He takes it for granted that the staff, the responsible officers, are properly carrying on their duties?

A.—My position is, I was in administrative charge of the work. Questions of policy of Government I do not think came within my scope at all.

Q.—Do you want to differentiate between the question of policy and the question of facts?

A.—I think it was a question of policy as to whether at that early stage after the very first season and before an opportunity had been given to Sir George Buchanan it was wise to express an opinion. It is a difficult question I admit.

Chairman.—In the report of 1924-25 there was a great deal that could have been said but was not said?

A.—There was, undoubtedly.

Q.—Have you any explanation?

A.—The explanation is that at that time the whole question of the Back Bay Reclamation had been submitted to an Advisory Committee, and they had appointed a Sub-Committee who were going into the whole thing. The results of the work in 1924-25 were received by me on the 17th of July 1925 and were communicated to Government immediately and to Sir George Buchanan. A meeting was held in Poona to consider what action should be taken. It was decided by Government that a letter should be addressed to Messrs. Meik and Buchanan, which is amongst these printed papers, and as regards the question of any further action in the way of publication it was decided that as the Advisory Committee or rather the Sub-Committee had been supplied with the figures and were engaged on their report, it would be better for that report to issue rather than for Government to issue a report themselves, because they would only be in a position to give the actual figures whereas the Advisory Committee and their Sub-Committees were working out forecasts which would show what the probable financial output would be likely to be.

Mr. Billimoria.—Do you agree with the conclusions of the Advisory Committee, what is your view about the report?

A.—I agree with them.

Q.—Agree with the majority or minority?

A.—With the one I have signed, the majority.

Q.—But after the minority report was also read have you had any occasion to change your views?

A.—I still adhere to them.

Q.—Just for a second, turn to page 2 of 1924 report with regard to dredging and filling. You say that the material proved to be of much better quality than anticipated being a hard clay with sand. Is that a fact?

A.—That is, it was a better material for reclamation purposes. It was on that account that Sir George Buchanan decided to do away with the cross walls that he proposed, and indicated a saving of 17 lakhs because this material was undoubtedly of a very good quality for reclamation purposes.

Q.—But you didn't draw the other picture that the quantity required was insufficient?

A.—I have just explained why it was not done. The figures were supplied to the Government and the Government waited for the report of the Sub-Committee.

Q.—By the end of March 1924, the approximate total expenditure on the Back Bay Reclamation up to 31st March 1924 including interest charges was 4 crores and 6 lakhs, more than 50 per cent. of your estimated amount had been spent?

A.—The estimate does not include interest charges.

Q.—It does not include interest charges and still in the working out of the cost per square yard you ignore interest charges?

A.—I will give the figures on which that Rs. 28 is based. I am not quite sure whether interest is included in that Rs. 28.

Q.—Then the figure would be very much larger?

A.—If you include interest charges. The figure varies, as the cost of land varies from day to day.

Q.—You anticipated a profit of 30 crores and large sums of money. You would take into account the interest before considering the profits?

A.—I never anticipated 30 crores. It has never been discovered where that figure came from.

Chairman.—We hope to find it out in England.

Mr. Billimoria.—Was it merely imaginary?

A.—We prepared a forecast on the basis of the 702 lakhs, and assuming that the whole of the land could have been sold in eleven years which at that time did not seem to be optimistic, and assuming an average rate of Rs. 50 per square yard, the forecast showed a profit of over 3 crores. I think an extra figure has been added on to the 3.

Chairman.—Sir Chimanlal says 30 crores, so that there was a difinite statement. He has gone to England and he must be asked to give evidence when we reach London.

Mr. Billimoria.—If you ignore the question of interest and if the scheme is not completed within thirty years, interest will go on piling up year by year, and the cost will be three times?

A.—Yes.

Q.—That fact was never taken into consideration? Time is the essence?

A.—It has always been taken into consideration in all forecasts which have been prepared by the Development Directorate.

Q.—In your last report for the period ending 31st March 1925, you repeat the same story that the scheme made satisfactory and steady progress. It is a very bold statement to make at the end of the year 1925 after having known what the actual state of affairs was in the Department and with the knowledge first-hand that the head of the Department had at his disposal at the time?

A.—I have already explained this point.

(*Chairman.*—Sir Lawless has already said he could have written reports of a very different tenour, but for purposes of policy he thought it expedient not to do so. We must consider that among ourselves.)

Chairman.—You agree with me you could have written reports of a very different tenour?

A.—I could have.

Chairman.—But as a matter of policy you thought it unwise to do so?

A.—I thought it was a responsibility which I could not undertake without consultation at any rate with Government. In a report that I was simply issuing myself and which Government were not going to see before issue, I do not think I could undertake the responsibility.

Q.—You remember Mr. Subedar at the time he drafted the Minority Report of the Advisory Committee complained certain information was kept back from him and he throws the blame at your door. It occurs at page 41 of the Report in his letter dated 6th June 1925. He says, "I regard this as an attempt to prevent relevant facts and figures being made available in order to enable members of the Committee to come to a proper judgment". Then he further goes on, "With regard to the papers containing the original loan and expenditure programme as fixed by the Government of Bombay and approved by the Government of Bombay, you were of opinion that it was all ancient history and would serve no useful purpose in the enquiry. You further thought that it was not relevant to the investigation which was in hand which referred to the future

rather than the past". Have you any explanation to offer about it, Sir Lawless, as to why Manu Subedar had occasion to complain ?

A.—The terms of reference to the Advisory Committee were to advise Government how far their activities should be continued or curtailed, and the sort of report they wanted was a report by the majority of the Sub-Committee going into the facts and advising whether blocks 1, 2, etc., should be gone on. Mr. Subedar took the view that he as representing the Indian Merchants' Chamber ought to make an inquiry himself into the inception and carrying out the whole scheme, and he began to ask for a large amount of information and various documents, and I first of all brought this up at a meeting of the Sub-Committee, and they decided that it was not within the terms of reference. They did not want to see these papers, and as a result I discussed the question with the Hon'ble Member, and we finally decided to supply Mr. Manu Subedar with everything we could, but there was a little delay in supplying him with some of the information that he wanted, because it was not always very easily got at. It was obvious Mr. Subedar wished to go a long way outside the terms of reference, and it was again a question of policy. But once it was decided he should be provided with all the information, I took particular care to see that so far as we could we should supply him with everything.

Q.—If he alleged there was an attempt to suppress, the allegation is not true ?

A.—It is not true, but it was necessary at that stage to consult Government whether as a matter of policy these documents should be supplied to a certain member though strictly speaking they did not come within the terms of reference.

Q.—Had you any information from Government. Did they ask you not to disclose ?

A.—When I discussed the question with the Hon'ble Member he agreed that the information should be supplied.

Q.—The Hon'ble Member's attitude was more candid than trying to suppress or conceal anything ?

A.—It was certainly. But I knew if I supplied this information what was going to happen. A minority report would be presented which would go far beyond the terms of reference. I thought it would be advisable to let Government know this and ask them if there was any objection. There was a little delay in my getting the authority and after that I gave the information.

Q.—If Mr. Manu Subedar came forward now you would without hesitation place everything before him. There would be no reluctance on your part to give anything ?

A.—The Committee has reported.

Chairman.—What did Manu Subedar want these documents for ? The position seems perfectly clear. Mr. Manu Subedar took a rather extended view of the scope of the terms of reference with which the other members of the Committee did not agree. But eventually the documents he wished to have were given to him and he wrote a report which if compared with the terms of reference, may to some minds appear many ways outside the terms of reference.

Mr. Billimoria.—I quite agree with the view you have expressed, but if we look at the public mind, the public is misled by a sentimental view when one gentleman makes an allegation that he had not this, that and the other.

Chairman.—If Mr. Manu Subedar makes any allegation, we will deal with it.

Mr. Billimoria.—I wanted to have from the witness, Sir, whether there was any attempt. He says there was not.

A.—I think he was perfectly satisfied afterwards. At the beginning he was not, but afterwards I do not think he had any cause for complaint.

Q.—Have you made any efforts to sell the land at Marine Lines, the Military having been now shifted to Colaba ?

A.—That is being disposed of on behalf of the Government of India.

Q.—You find signboards there asking to apply to the Development Department ?

A.—The Development Department are acting as agents of the Government of India.

Q.—Have you made any efforts to dispose of them ?

A.—We have put up those notices. We have received a few tentative offers.

Q.—Are they tempting ?

A.—No offers come forward which are what the Government of India expect.

Q.—May we know what offers you expect ?

A.—I think the Government of India hope to get in the neighbourhood of Rs. 200 a square yard for that land.

Q.—Do you hope to get that in this depression of the property market ?

A.—The Government of India are not anxious to sell. The land I understand cost them originally nothing. They are not paying interest on the value and I think they would prefer to wait a little rather than force the land on the market at its present state.

Q.—The original idea was,t his property was to be sold and payment was to be made to the Development Department?

A.—I do not think it has been ever stated, but it is part of the whole transaction of the military land scheme that certain properties in Bombay are to be sold and land is to be bought from the Bombay Government, and also buildings are to be erected at Colaba. It was always part of the scheme, but I do not think that the proceeds of the sales of the Marine Lines land have been earmarked, for the purchase of land at Colaba.

Q.—Is it true that only two bungalows in that area have been let?

A.—I think more than two bungalows.

Q.—Are you realising from the rent what would give you the return in your capital cost of Rs. 200 a square yard?

A.—The bungalows are in very large compounds. You cannot get Rs. 200 a square yard unless those existing buildings were demolished and the ground was sold in much smaller plots. The area built over will have to be much greater.

Q.—I shall now take you, Sir Lawless, to a report which an expert on behalf of Sir Ratan Tata had drawn up before the Development Committee in 1914. I hope you know something about it. You were one of the witnesses that appeared before that Committee in 1913-14.

A.—I do not know anything about this report. I saw it only lately.

Q.—Do you think this Report must have been considered by Government? It was prepared under the orders of Government. Kindly turn to page 188 of that volume. You find in paragraph 8 the passage occurs, "While we consider the Government cost figures as impossible on such a scheme as we deem proper and sufficient". That is a report made by Messrs. Jacobs & Davies, Engineers. Do you know anything about Messrs. Jacobs & Davies, whether they are a reputable firm? You see they are expressing doubt about the cost of Mr. Kidd's estimate?

A.—I doubt if there was an estimate by Mr. Kidd. I do not think I have seen an estimate of Mr. Kidd.

Q.—In the report of Mr. Kidd there is a statement that land could be reclaimed at Rs. 5 a square yard. Is not it there?—Based on that estimate Sir George Buchanan also comes to the same conclusion.

A.—That was what he anticipated.

Q.—If you will kindly turn to page 189, the Engineers Messrs. Jacobs and Davies say, "It goes without saying we gave you the best possible advice, not only with regard to yourself, but presumably with regard to the investing public, and stated we believe that the pressure on the available area of Bombay did not warrant any such scheme of reclamation, the return from which would seem to be highly doubtful, to put the case mildly." I will take you a little further on. At page 191 top they say, "While we consider the Government cost figures impossible". Then I will refer you at page 193 to a most important paragraph to which I hope you will give some attention. (Then Mr. Billimoria read the passage commencing from "As to the way in which the reclamation would be used, etc., etc." occurring at page 193 of the Report of the Bombay Development Committee, 1914, and ending with, "there is need of warning against a common error. That is estimating the cost of construction too low" at page 194.) Having read all this, have you any remarks to offer?

A.—I can only say that Mr. Hewett made a very good prophecy.

Q.—That was thirteen years ago?

A.—He was more or less right in the advice he gave to Mr. Tata.

(*Chairman.*—Sir Lawless Hepper came in November 1920 when it had been decided.)

Mr. Billimoria.—(I want to find out whether as administrative head of this Department he ever came to know of this document.) This is a Government document, and did you as an administrative head of the Government ever come to know of this Report?

A.—I knew of this Report.

Q.—What was your advice to Government?

A.—What advice could I give to Government? Government had Mr. Kidd to advise them. The Government had also this report and a subsequent report of Sir George Buchanan, and they had decided, knowing all this, to carry out the work, and the Government of India and the Secretary of State agreed. The thing was settled.

Q.—The point I want to get out is that there was a huge difference between the cost worked out by Mr. Hewett and the cost of Sir George Buchanan and Mr. Kidd. Mr. Hewett as far back as 1913 when conditions were normal estimated it at Rs. 18 to 19 a square yard. Did not any one pay any attention to it? Did they not consider this, as a financial proposition, was a question requiring thorough consideration?

A.—I think I can only say that my instructions as Director were to carry out the sanctioned scheme.

Q.—You will admit that conditions in 1919 were different from what they were after the War?

A.—Yes.

Q.—Things were cheap?

A.—They were pre-War conditions.

Q.—Did you expect the boom after the War to last for a generation or ten years as to base your calculations on a boom period?

A.—I was not in Government service when the Government scheme was launched.

Q.—You still continue to be one of the Trustees of the Port of Bombay?

A.—Yes.

Q.—And a member of the Improvement Trust?

A.—Yes.

Q.—There is roughly 8 million square yards of land in and round Bombay and available for disposal?

A.—I am not prepared to say that. We went into the question and the figures are shown in paragraph 9 of the Sub-Committee's Report.

Q.—They show that the land still available is 86 lakhs?

A.—But that is not all ready.

Q.—Assuming it was not ready, it was likely to come into the market. If this vast area of land was about to be made available (I do not think it was because the scheme was launched seven years ago: there is no doubt there must have been a large amount of land either actually existing or contemplated), that would in some measure interfere with the sale of the land in the reclaimed area?

A.—We discussed it in the Committee and our opinion is given in the Report. We say that the great bulk of this land, in the hands of the Improvement Trust and the Municipality, lies north of Dadar and will not compete directly with the Back Bay Reclamation. That applies to the greater part of it. The Port Trust land at Colaba, the Colaba Land and Mill Company's and the Railway's lands as well as the lands belonging to the Military at Colaba must compete to some extent whereas the Military land on Queen's Road, about a lakh of square yards, will do so directly. That was the opinion that we formed, and I don't think I have changed my opinion. I adhere to the view expressed in the majority Report.

Q.—You as a member of the Improvement Trust Committee are possibly aware of the figures with regard to the Trust lands during the last five years. The area disposed of according to the official statement in 1921 was 5,84,000 sq. yds.; in 1922 about 1 lakh of sq. yds.; in 1923, 1,64,000 sq. yds.; in 1924, 1,44,000 sq. yds. and in 1925, 39,000 sq. yds., making a total area in five years of about 10,37,000 sq. yds. all over the city of Bombay. Do you expect to dispose of 22 lakhs of square yards of land in the reclaimed area when the Improvement Trust felt difficulty in disposing of 10 lakhs in five years?

A.—The Improvement Trust and Port Trust figures given in the majority report of the Advisory Committee show that those two bodies disposed of 36 lakhs of square yards in 25 years, and any scheme of disposal of land in the Back Bay Reclamation we would make now would not consider any period of much less than 25 years.

Q.—Do you expect after the whole thing is reclaimed it would take 25 years to sell?

A.—No, we have con templated we would begin the disposal of the land before the whole of the scheme is finished. We have provided for it in the forecast.

Q.—As one of the members of the Improvement Committee you know that a very large area has been given up by people who had got those plots on lease on account of various disabilities?

A.—Yes.

Q.—And that comes to five hundred thousand square yards of land given up by the people?

A.—Yes. We took care that those figures were excluded from our figures showing 36 lakhs of square yards of land disposed of.

Q.—After taking every fact into consideration do you think that within a period of 25 years you would be in a position to dispose of the land in the reclamation?

A.—I never said anything of the kind.

(*Chairman.*—As I understand you, the plan was, as soon as any land was available for sale, you would sell if you got a purchaser at the proper price?

A.—Yes.

Q.—And what you contemplate is the continuance of those sales for perhaps a period of 25 years?

A.—Not less than 25 years.)

Mr. S. B. Billimoria.—A.—In table 3 we worked out a forecast showing the disposal at an average price of Rs. 50 a sq. yard, in 22 years, but didn't commit ourselves by saying that the land could be sold in that time.

Q.—Even assuming that you were able to sell within a space of 25 years at the rate of Rs. 50, do you think it would be a losing proposition if you take into account interest charges?

A.—We have tried to bring out the facts in these tables which of course include interest charges. We say in the report if the disposal could be realised as assumed it would reduce the debt at present value to 367 lakhs in the case of scheme 3, and 337 lakhs in the case of scheme 4. But as this may be considered an optimistic estimate, we have prepared a statement for comparison which shows the results in terms of debt of present value, if the average remained at Rs. 50, but if the period of disposal were extended to 25, 35, 45, or 50 years; and we give the price that we would have to realise for the land to recoup the whole of the expenditure with interest; for 25 years it comes to Rs. 93; for 35, 121 and so on; and this is based on the assumption that the dredger will only give an actual output of 7 lakhs of cubic yards as it did in the season of 1924-25.

Q.—It might reduce the cost of 95 to something less, but would that be appreciable?

A.—I propose to revise the estimate.

Q.—Even assuming the figures as they stand, do you hope that you would ever expect purchasers to come forward and pay you the price that you have set in the table?

A.—I am quite unable to answer that question. I think there may be people of greater experience than I have who at the present moment, in the present depressed conditions of Bombay, would hesitate to make any forecast. I certainly would not.

Q.—Ordinarily what would you think without being definite about it?

A.— I am quite unable to give any opinion.

Q.—Do you hope that the chances are that the Development Department may be able to dispose of the land at prices stated in the table? Any possibility of it?

A.—We didn't go beyond the recommendation that Government should complete blocks 1, 2 and 8. We have given figure and we have expressed the opinion there of what Government might expect to realise for those areas but we did not express any opinion as to what would be recouped in the case of the completion of the whole scheme.

Chairman.—Mr. Billimoria is entitled to ask whether you have any opinion. Having regard to your experience and long association of Bombay, do you think it likely that the reclaimed land, if reclaimed in its entirety, could be sold in 25 years at Rs. 93 a square yard? You can give any answer you like. The question is admissible.

A.—I am not able to give a definite opinion, but I should like to refer to paragraph 23 of the majority report of the Sub-Committee referring to their statement and I agree with their statement, "in any case unless there is marked improvement in the output of the dredgers and unless the conditions are more favourable than we have thought it prudent to assume, we foresee a loss on the scheme". That means to say, that unless the disposal is going to be in 25 years there is going to be a loss.

Mr. Billimoria.—You confirm that opinion that there is bound to be a loss?

A.—No, I support the statement in paragraph 23 that unless there is marked improvement in the output of the dredger and unless the conditions are more favourable than we have thought it prudent to assume, there is likely to be a loss on the scheme. That means to say that unless we dispose of the land in 25 years, we do not think we will get an average price of Rs. 93.

Q.—You have some experience of the Ballard Estate as a Trustee of the Port of Bombay?

A.—Yes.

Q.—You know that investors had burnt their fingers very badly by paying enormous prices for the land, because it is a business locality?

A.—I think it was speculation.

Q.—I suppose it is to your knowledge and you must have heard that property there which has cost 3 or 4 lakhs, the owners are willing to part with for Rs. 50,000 because of the heavy ground-rent and other prohibitive charges?

A.—The ground rent is what the tenants themselves agree to pay.

Q.—You also notice that many of those blocks are absolutely vacant. They were intended to be for business purposes.

A.—They paid too much for the land. There is no doubt about that.

Q.—You know the Hornby-Ballard scheme the Municipality are undertaking now. They acquired a certain amount of land from Hornby Road to Ballard Estate, making roads and developing that property. A very large area will be available when that is done, is that so?

A.—I think so, by means of displacing a large residential area.

Q.—In Churchgate street new palatial houses are without tenants?

A.—I think there again too much was paid for the land.

Q.—I am only confining myself to the present conditions as they are. You also know a large number of commercial houses have shifted from Hornby Road and Esplanade Road to Ballard Estate for cheaper rents ?

A.—I was not aware of that.

Q.—When you complete the block No. 2, don't you think all these factors will come in your way, firstly the vacancies in buildings. Is there any possibility then in view of these circumstances of people preferring to go to the other side of the Churchgate station near the sea for business purposes ?

A.—I don't think it was anticipated by the Sub-Committee that the land in block 2 would be devoted to business purposes. Whatever the demand is, it may be for residences ; it may be for buildings of the type of offices on the ground floor and residential houses above.

Q.—As a rule people would pay a wrong price and there would be a tremendous amount of difference. A man would pay Rs. 70 for residential purpose, and the same man for the same place for another purpose would pay higher ?

A.—They are paying Rs. 700.

Q.—If you are not letting out for business purposes, do you think that people would pay Rs. 93 per square yard for residential purposes ?

A.—The Committee have not expressed any opinion as to for what purposes the land should be used.

Q.—I ask you as to whether there was any probability of any commercial house going beyond Churchgate station for business purposes, when there is a tremendous amount of buildings available at present. You don't expect people to shift their offices from Hornby Road and go to Churchgate station ?

A.—I think it depends largely on the price of land. If a new firm has to start an office and if they go to Ballard Estate, Hornby Road or Ballard Pier Road and they have to pay Rs. 500 a square yard for land for their office, it is possible they will think it economical to pay to Government Rs. 80 to put up a residence or office.

Q.—How many firms do you expect will come forward to occupy such a position in the island of Bombay far distant from the vicinity of banks and business places ?

A.—I have made no calculation of the number of buildings.

Q.—Do you believe people will go beyond Bori Bunder where most of the houses are within a compact area ?

A.—As new roads are made like the Hornby Road, Ballard Pier Road, etc., old houses must be displaced. It even happens sometimes that old houses have fallen down.

Q.—Do you think people paying Rs. 20 can go and live in Colaba area ?

Q.—Do you hope that the reclamation could in any way be used for Government purposes ? There is congestion in the Secretariat and so on. The question did arise that Government did require some land for their own requirements. Do you think it a suitable area for them to transfer their buildings to this area ?

A.—There are new Secretariat buildings shown as occupying block 2, but the Advisory Committee have represented to Government that it is essential that the reservation should be given up and the area sold to the public.

Q.—They incur the cost of reclamation and they pay it themselves ?

A.—We suggested that it should be taken further south.

Q.—If huge buildings like these are put up on the new reclaimed area, don't you think it would shut out the breeze and interfere with the health of the city and spoil the amenities of the city rather than improve them ?

A.—I think it depends on the lay-out of the area. In the provisional lay-out plan, 50 per cent. of the area is to be unbuilt on.

Q.—Can you afford to have large recreation grounds and open spaces in view of the heavy cost ?

A.—That will have to be considered.

Q.—You don't know how much area is set apart for recreation grounds and open spaces ?

A.—I think 458 acres and the building area about the same.

Q.—That is, taking the whole scheme ?

A.—Taking the whole scheme excluding the military area.

Q.—If you confine yourself to blocks 1, 2 and 8, 8 goes out for military purposes and there remain 1 and 2. How much do you propose to reserve for recreation grounds and open spaces ?

A.—In block 1 there is a recreation ground provided of 54 acres. In page 15 of the Report of the Special Advisory Committee it is stated " a further suggestion the Special Committee desire to make is in regard to recreation grounds in block 1, without committing themselves to any definite recommendation, they would draw the attention of Government to the fact that if considered desirable the financial position might still further be retrieved if a part of this area is reduced ".

Q.—That means you are going to curtail the open spaces and recreation grounds?

A.—That is the conclusion that Government have come to and the Consulting Surveyors to Government are now engaged on a lay-out plan for that area in which the open space will be reduced and more of the land will be made available for sale.

Sir Frederick Hopkinson.—Am I right in assuming that excluding the military area the quantity of land available for sale will be approximately 450 acres?

A.—It is 22 lakhs of square yards net building area.

Q.—That is the utmost you will have to sell?

A. No. It depends on the provisional lay-out, which provided very liberally for roads and open spaces.

Q.—I put you a sufficiently large number of questions on this point. I will put a very definite question now; whether it will be an attractive business proposition, leaving aside the question of beautifying the city, do you think it will be an attractive business proposition, irrespective of the question of the advantage of a marine drive?

A.—I think the city will secure much needed area of land for expansion. I do not know what the actual density of population is, but I think it will be agreed that the density of the population is very much more than in any modern city and that people, before very long, the standard of living rising as it is now, will demand to live under better conditions. They will not continue to live indefinitely to pile up in these houses that are falling down. I do not see how you are going to provide better housing conditions unless you have a new area.

Q.—I quite agree with you that the conditions are now altered, but how many do you expect will go and live in an area where the rents will not be anything under Rs. 450. How many do you think will come forward?

A.—It is quite impossible to give a definite calculation. But speaking in the Legislative Council in March I expressed the opinion that it was a mistake to assume that the reclamation was going to be covered with buildings such as those on the Ballard Estate in the near future. I think if that time ever comes it will be a long way off. But I said that I did not see why Government should not lease the land on short term leases or allow cheap buildings to be put up where people could live in small cottages or bungalows in their own compounds. When I came to Bombay, people used to live in tents. It is only recently that they had started to put up enormously expensive flats with hot and cold water laid on. In the future the tendency may be to live in cheaper houses on the reclamation.

Q.—It is a very good outlook, no doubt, but how many people do you think can afford to go and live in bungalows with heavy rents?

A.—But I think the rents would be cheaper.

Q.—If you pay Rs. 93 sq. yd. alone for the land, and interest is to be put on it, what would be the rent?

A.—Rs. 93 is based on the output of 1924-25. We have assumed Rs. 50 for the whole reclamation, and have taken Rs. 80 for Churchgate and Rs. 20 in block 7. If somebody leased land on the basis of Rs. 25, say 500 sq. yds., the rent would not I think be very high.

Q.—If it had been Rs. 20 the scheme would be a huge success and there would have been no enquiry?

A.—The land will vary in value on different parts of the reclamation. The Advisory Committee have suggested from Rs. 80 in the neighbourhood of Churchgate street to Rs. 20 down near the military area in block 7. That is an average of Rs. 50. But where you have an average, they must be naturally lower levels, and even if you take it that in block 7 though the average is Rs. 20 it will be less than that in back plots.

Q.—When you were appointed Director of Development what was the salary that you obtained?

A.—Rs. 6,000 a month.

Q.—What is it to-day?

A.—Rs. 4,000.

Q.—Is it an Inchcape axe or for some other reason that the salary has been cut down?

A.—No. When Sir George Lloyd asked me to take up this appointment I was rather reluctant to do so, but he was good enough to say that he was very anxious that I should take it up and I finally said I would take up if we could agree as to the terms. And at that time my total emoluments, including my military pension, were a little over Rs. 5,000. I said that I did not wish to leave the G. I. P. but if the Government were prepared to pay me 6,000 a month I would come. But if Government could not pay that amount I would not be at all sorry. So it was agreed to give me 6,000 for 5 years. But the Secretary of State in sanctioning that appointment sanctioned 6,000 as personal to me, but stipulated that my successor would be paid at the rate of 4,000. Then before Sir George Lloyd left India he asked me to agree that if Government wanted me to stay on after the 5 years I would remain, and sometime in the 5th year I wrote to Government and said that I had made this promise to Sir George Lloyd, and asked them if they wished me to stay on after that time. If so it was only for a short time, I was quite prepared to fulfil my promise.

Q.—I am sorry to ask this personal question. I put it to you because it was mentioned it was cut down, just because of bad work?

A.—Government replied that they would be very glad if I could stay on for a while. At that time in view of the financial position they did not feel that they were in a position to go to the Government of India and to the Secretary of State and ask them to continue the salary of 6,000, and if I wished to continue it would have to be at the rate sanctioned for my successor. I agreed as it was for a short time. I did not mind doing it because the Government wished me to do so. There is no ground for the suggestion that my pay had been cut down for other reasons.

Q.—Have you had any retrenchment in regard to the superior staff or other staff?

A.—We had large reductions in the way of retrenchment. I think a reply was given to the Legislative Council that there was retrenchment to the extent of Rs. 90,000. In the Poona Council Session we gave the reply that it was 34 officers and 300 subordinates. There have been very very large retrenchments.

Q.—What commission have you paid up to date to Sir George Buchanan?

A.—6,70,000.

Q.—That is over and above the Rs. 20,000 for consulting fee for drawing up the report?

A.—Yes.

Q.—According to the agreement of Sir George Buchanan between himself and the Secretary of State, it did not matter to him what the scheme did cost. The original cost was 367 lakhs. Supposing it went up to 10 or 11 crores it did not matter to him. He would only charge commission. The higher the cost the better for him?

A.—Yes.

Chairman.—Except that he would lose his reputation.

Mr. Billimoria.—There was no maximum fixed as far as the commission was concerned?

A.—No.

Q.—If the amount went up largely it did not matter to him. It would have been a profit to him.

Q.—Did he offer any advice or assistance to you, to the Chief Engineer and other officers?

A.—He spent an average of two months every working season and he went carefully over the work with the Engineer and he gave instructions where he thought it ought to be done in a different way. He left his opinions on record at the end of every visit as to how the work should be carried out.

Mr. Billimoria.— Did Sir George Buchanan, as responsible engineer, offer any advice or assistance to you, to the Chief Engineer or to other officers?

A.—He was out here at an average of two months per working season and he went carefully over the work with the engineers and gave instructions how the work should be done.

Q.—Did he exercise any supervision over the work?

A.—He was of course, at an average, two months out here every working season.

Q.—He knew what was going on here?

A.—He was receiving weekly reports from the Chief Engineer with very full details, figures, plans and every possible information was sent to him. He was at any time in a position to lay his finger on anything he liked.

Sir F. Hopkinson.—Did he lay his finger on the dredger?

A.—No.

Mr. Billimoria.—You are certainly aware of the reasons that lead to the termination of his agreement by the Government?

A.—Yes.

Q.—In your opinion you feel certain that Government were fully justified in taking the step they have taken?

A.—I think they were. I recommended it.

Q.—You still consider and hold that Government were absolutely justified?

A.—Undoubtedly.

Q.—Sir George Buchanan assured Government that the scheme would be a financial success. Had you any doubt yourself at the time the scheme was launched?

A.—I do not know if Mr. Kidd or Sir George Buchanan went into the question of recoupment. I think they only prepared works estimates.

Q.—You did not think that 702 lakhs would result in a financial loss?

A.—No, we did not think so.

Q.—In reply to Sir Frederick Hopkinson you said that you were building the sea wall at both ends. Which is the most expensive method of building the wall?

A.—We are doing it in two ways. The Marine Lines portion is more expensive.

Q.—And you still continue doing the expensive job ?

A.—It depends on the difference in level. The Colaba wall is on rock at a comparatively high level.

Now I shall refer to some of the allegations made.

Q.—Do you know if any discounts or commissions were allowed at the time of the purchase of the dredgers ?

A.—I have never heard of any instance of that kind.

Q.—Who advised Government to enter into a long term contract for the purchase of cement ?

A.—I did.

Q.—What price did you enter into contract ?

A.—We agreed to pay 15 per cent. over the actual cost. At that time the price of cement was very high and we were going to use a very large amount of cement and the cement companies were going to charge us a very high price. So we called for tenders in India to supply cement for 10 years either at a fixed rate or on an actual cost plus percentage basis. Finally we made an agreement on the basis of actual cost plus percentage of profit.

Q.—What does the average cost work out to ?

A.—The average works out to somewhere about Rs. 60. When the contract was first made, the price at which we got cement under the contract was much below the market price but then came a slump and the price of cement went down and down until at one time Indian cement was tendered to the Port Trust as low as about Rs. 35. Now I understand the companies have come to some arrangement under which they regulate the price and the prices have gone up again.

Q.—So if you had not entered into this long time contract, you would have paid according to the ruling price ?

A.—The ruling price at that time was well over a hundred.

Q.—But did you expect the price to continue for a number of years ?

A.—I do not think anybody was in a position to say what was going to happen. But you must remember that for a part of the time of contract we were getting cement below the market price and then for a few years we were getting it above the market price. Now the price has gone up again. I think on the whole for 10 years it would have worked out satisfactorily.

Q.—You had a very large amount of cement at hand for sale ?

A.—We had only a small amount. We had ordered cement for continuing the Colaba wall, but we got the cement companies to cancel the order.

Q.— Did you pay any compensation ?

A.—No.

Q.—What about that small amount of cement? Have you sold it ?

A.—The Chief Engineer tells me that there was a surplus of 1,800 tons; that has been sold.

Q.—How was it sold; by private treaty or by inviting tenders ?

A.—By inviting tenders ?

Q.—But before the tenders were invited you sold a very large quantity ?

A.—It is not true ?

Q.—Is it true that you at one stage in the early stages of reclamation intended to float a debenture loan of 60 lakhs to help a cement company ?

A.—That was a proposal which the company made themselves. They made it a condition of a certain offer but it was turned down by Government.

Q.—Do you know of the existence of the Indian Construction Company ?

A.—Yes.

Q.—Were you in any way connected with that company, directly or indirectly ?

A.—Not at all, directly or indirectly.

Q.—Do you know Colonel Grisewood who was the managing director ?

A.—I have seen him. It was proposed at one time that Colonel Grisewood or rather his firm should be given the contract on cost price plus profit for the first 8,000 feet of the Colaba wall. That was proposed in February 1920. A conference was held in the Secretariat which I was asked to attend when the question of giving the contract was considered and I was able to prevent the contract being given because Colonel Grisewood was not a contractor as far as we knew and had not done any practical work of any kind as a contractor. I was anxious that no contract should be given until I took over charge as Director.

Q.—Is it to your knowledge, as it is alleged, that some highly placed official of Government actually promised to give Colonel Grisewood the contract of the reclamation area or some part of it ?

A.—A D. O. letter was written to Colonel Grisewood which might have been read, I think, as practically offering to give the firm a contract of 8,000 feet.

Chairman.—Who was the writer of the letter?

A.—I think it was the late Mr. Mead, Secretary to the Government of Bombay, General Department.

The witness was asked to produce that letter which he promised to send.

Mr. Billimoria.—The Indian Construction Company was in fact started because of the alleged promise held out?

A.—I do not know.

Q.—Do you know that the company, when it was unable to get the contract, was eventually wound up?

A.—I do not know if that was the reason. I had an idea it changed into a limited company under some other name.

Q.—Do you know from whom this "Kalu" was purchased?

A.—It was purchased from the Government of India, that is, from the Disposals Board which succeeded the Indian Munitions Board.

Q.—Whose property was it?

A.—It was originally the property of the Bombay Port Trust and then the Government of India purchased it during the war and sent it up to Mesopotamia to do dredging work that Mr. Lewis was engaged on. Sir George Buchanan was also there.

Q.—Do you know that in the books of the Port Trust the value of "Kalu" was written off because she had done sufficient amount of work and with depreciation they had written off the total amount of "Kalu".

A.—I do not know that. I only know that they charged the Government of India a fairly stiff price for it. The Government of Bombay paid £75,000 for the "Kalu".

Q.—Did you make any enquiries before you took over this "Kalu" as to whether it had given satisfaction to the Port Trust authorities?

A.—I do not know because it was about 18 months before I took up my appointment.

Q.—Do you know the circumstances in which Sir George Buchanan recommended its purchase?

A.—No. But I believe that it was reported on and examined by the Dockyard authorities on behalf of Government. Certain officials of the Royal Indian Marine reported on it before its purchase.

Q.—Did they know the Port Trust were not satisfied with its working?

A.—I cannot say.

Q.—Is it a fact that the quarries are practically exhausted? You have used up all the material that is likely to be used?

A.—Is it stone you mean?

Mr. Billimoria.—Yes.

A.—It is absolutely untrue. Two or three times the stone, that is likely to be required is still left.

Q.—In inviting tenders for filling up blocks, you have indirectly stated therein that Kandivli quarry is exhausted.

A.—I particularly asked if your question was about stone. That contract, tenders for which are being called for, is in connection with moorum filling. It is a fact that there is only sufficient moorum at the Kandivli Quarry to keep 2 trains a day working for about 8 months. After that the quantity will be exhausted. But there is a neighbouring hill close by which we are inspecting and if it is decided to continue to get our filling either through Government agency or through a contractor, the material is there.

Q.—Is it true that you are getting luxurious bungalows built somewhere near the quarry?

A.—There is a small bungalow for the officer and the foreman to live there but it is anything but luxurious.

Mr. Billimoria.—Is it a fact that you have got a tremendous amount of machinery lying about there which has never been used for the workshop and some of it absolutely unpacked and in cases?

A.—There is one steam shovel which has not been used; otherwise the plant has all been used.

Q.—Is it a very expensive part of the machinery?

A.—It costs £9,000. Barring that all the machinery has been used.

Q.—And that was required for reclamation works?

A.—Yes.

Q.—You could not have done without it?

A.—No; we could not. The steam shovel has proved too expensive to work and it does not pay to work.

Sir F. Hopkinson.—That is unusual?

A.—It is the experience of the Port Trust, the G. I. P. Railway and the Municipality that it does not pay to use the steam shovel in Salsette.

Sir F. Hopkinson.—I suppose it belongs to the same class of family as the dredger.

Mr. Billimoria.—I want to ask you one question more. It is No. 37 which has so ably been drafted by our worthy Chairman: Generally if the work has not been carried out in accordance with Sir George Buchanan's estimates, can it be said how and in what manner, the failure has arisen and to whom it is attributable? It is a very general question.

A.—I think it is perfectly clear that the failure has arisen owing to the deficiency in the output of the dredger. I have tried to show in my statement that apart from that deficiency of output there is no reason to suppose that in other parts of the work the estimates will be exceeded except of course in the case of plant for the Back Bay which is also an item connected with dredger.

Mr. Billimoria.—That does not answer the question fully?

A.—It is in any opinion due to the fact that Sir George Buchanan overestimated the output of the dredger. But he has publicly stated that it is due to the mishandling of the dredger by the staff in India. These are the two views. My view is that the staff in India have done their best and could not possibly have done any better and that the fault lies either in the fact that the machine was not designed for that class of material, or that in framing the estimate the output of the machine was assumed for a particular type of material which does not exist in the harbour.

Sir F. Hopkinson—Did it never occur to you to send a cable to Sir George Buchanan to come out by the next boat and show how it was to be handled?

A.—He was out here when the dredger was working in the first season.

Q.—Did he show you how to handle the machine?

A.—No. On the contrary he was pleased with the working of the machine.

Chairman.—This question of mishandling was only raised by him since the Advisory Committee's report was out and the allegation of mishandling was made in the statement to the press which Sir George Buchanan issued?

Sir Lawless Hepper.—That is right.

Mr. Billimoria.—Did Sir George Buchanan ever complain to you when he was out here as to how you were to handle it?

A.—On the contrary he spoke rather in terms of appreciation of the work that was being done.

Q.—When disappointing results of the working of the first season were known, did he complain about it?

A.—What he said was that the dredger had not been given a fair trial, the staff were a little inexperienced and the work was of a difficult character. Give them a little more time and it will work well and up to the standard.

Q.—Did he ever in discussion complain that the dredger was being mishandled?

A.—Never; on the other hand he always spoke well of it.

Q.—And therefore he never told you how it ought to be handled.

A.—No.

Chairman.—In any of the reports which he has made is there any criticism on the way the dredger has been handled?

A.—No.

Sir M. Visvesvaraya.—There is one question about the responsibility of yourself and that of Sir George Buchanan that I want to put. You said that Sir George Buchanan gave you technical advice. You as head of the Development Directorate were responsible to carry out the work; you controlled the work, you administered the work, its execution was carried out under your supervision. Instead of a contractor doing the work, you are doing it yourself departmentally. You are getting advice from the Engineers?

A.—No, Sir George Buchanan protested against being called Consulting Engineer. He was the Engineer in charge.

Q.—In what way did the contract differ from that of a consulting engineer?

A.—That is given in the contract.

Q.—His responsibility counts for nothing as regards expenditure and progress of the work. A Consulting Engineer is one who watches the work and gives technical advice when he thinks it is needed. I do not see why Sir George Buchanan did not think so himself. There is no difference between his and other agreements in similar cases.

Then he read out 1st clause of the agreement.

Sir George Buchanan stated that he was the responsible engineer, but are you going to accept such a statement? Many concerns like Port Trusts and Railways have Consulting Engineers who advise on administrative and technical questions. They give the works the benefit of their wider experience. They may be asked to order stores or material and paid a precentage on what they buy but they have no real responsibility either for the cost or the progress of the works.

A.—In this case they did.

Chairman.—We must decide this point in the contract, because Buchanans themselves agree to put themselves in a much more responsible position and say that "we are the actual engineers responsible for the conduct of the work" and the question arises whether they did exactly describe their functions in accordance with clause 1 of the agreement.

Sir M. Visvesvaraya.—They may say what they like. The position of Government is that of owners. Supposing the work was done by a contractor instead of departmentally, the contractor would not throw the blame for his losses on the technical engineer.

Chairman.—You have to look to the contract for that and see what were the responsibilities that Buchanan undertook.

Sir M. Visvesvaraya.—If he was a consulting engineer, well and good; you are responsible for the work and not he.

A.—They are the responsible engineers. It was on the understanding that this firm, an experienced firm, were the responsible engineers that I agreed to take up this appointment as Director otherwise I would not have accepted the responsibility for carrying out this scheme.

Q.—As regards expenditure on a huge work of this magnitude, the responsibility must be that of the Director.

A.—I am prepared to go as far as this. In connection with the work, it was necessary, from time to time, to let out contracts for the supply of material or for loading or for unloading stones. They were not large contracts, they were petty contracts and strictly speaking, in the terms of that agreement, I think, all the tenders on every occasion should have been sent to the engineers as an ordinary matter of working. But having regard to the fact that Sir George Buchanan was sometimes in Australia and sometimes in Africa and at other various places, it was not practicable to send all, cases of tenders for contracts that used to arise. But it may be said that in those cases I was responsible for that expenditure on them, but having tacitly accepted the situation, I think, it might be said that he was responsible.

Q.—The accounts were kept by you. He had no check on expenditure; he did not receive any account sheets.

A.—I am quite prepared to agree that if the anticipated excess over the sanctioned project estimate can be shown to be due to any act of commission or omission on my part, the responsibility is mine.

Q.—Reading from the agreement it is clear that their position is that of consulting engineers?

A.—They are responsible for the whole of the conduct of the works.

Q.—When you found that the dredger did not come up to expectation you might have taken steps to have the question investigated by communicating direct with the firm. Some action was necessary on your part if the Consulting Engineers failed to take any themselves. You have stated that you are not responsible for the expenditure or the progress of the work and you say that the responsibility must rest with Sir George Buchanan. What does his responsibility amount to? What compensation can you demand or obtain from him if he failed to do his part?

A.—I have stated that they are the engineers responsible under the contract and as such they were the responsible engineers for carrying out the work and if the work went wrong and did not come up to their expectations which they had led Government to believe, then they should be held responsible for it. If it can be shown that the anticipated excess is due to any action of mine or to any omission on my part to do anything that ought to have been done, then so far as that goes, I am prepared to accept responsibility.

Sir Frederick Hopkinson—In one case of sealing the wall you departed from this position?

A.—If it is held, as it may be held, that the material will not make good ground as some authorities say it will not, and that it was a mistake to do that, I am prepared to accept responsibility for it.

Chairman.—Do you know whether Sir George Lloyd consulted Engineers at all up to August 1920 apart from Sir George Buchanan?

A.—I am afraid I cannot say.

Q.—Sir George Buchanan's report was received in October 1919. Sir George Lloyd arrived in India on the 16th December 1918. He had succeeded Lord Willingdon. This question of reclamation had arisen in Lord Willingdon's time?

A.—Yes.

Q.—And therefore Sir George Lloyd on his arrival found this question one of the uppermost questions before him?

A.—Yes, I think that is so.

Q.—In 1918 the Government of Bombay wired to the India Office saying that a re-examination of the Back Bay Scheme was a matter of great urgency and asked the Government of India to choose and send out the best man available?

A.—Yes.

Q.—That was before Sir George Lloyd had arrived here at all. Therefore, when he came on December 16th, 1918, Sir George Lloyd found this matter one of the most prominent before the Government of Bombay?

A.—Yes.

Q.—What I want to know is, can you give me the name of any expert engineer, of any P. W. D. man, anybody in the whole world whom Sir George Lloyd might have consulted as regards the practicability of the scheme?

A.—No, I am not able to give the name of any Engineer.

Q.—I think what the Committee would like to know is whether the scheme was decided upon simply upon the report of Buchanan or whether when the report of Buchanan was received, Sir George Lloyd and other members of the Government of Bombay had consultations with other experts?

A.—I am unable to say whether they did or not.

Q.—You have been asked a number of questions about the report of the Development Directorate. Did you, before you issued any report in any one year, have any discussion with any member of the Government as to what you should say or omit from the report?

A.—Only in the case of the last report for the year ending March 1926.

Q.—That deals really only with the year 1925. I will frame my question definitely: from 1921 to March 1925 did you, before you issued the reports, have any discussion with any member of the Government as to what you should say or omit?

A.—No, I did not.

Q.—And therefore whether these reports are as full as they should be or not, you accept the responsibility for what you have done?

A.—I accept responsibility. . . . .

Q.—You pointed out to us that you were undoubtedly influenced by considerations of policy?

A.—Yes.

Q.—And that you had to be careful not to make statements which might create panic?

A.—There have been only two pumping seasons, and I do not think that any panic should have been started after the first season, it was started after the second one.

The Committee assembled at 11 a.m. on the 9th August 1926, all the Members being present

4th Witness

Mr. C. R. Brims, Deputy Chief Engineer Dredging

Chairman.—I have asked Sir Frederick Hopkinson to examine you first.

Sir Frederick Hopkinson.—What is your Christian name ?

A.—C. R. Brims.

Q.—You are engineer in charge of dredging ?

A.—Yes. I am Deputy Chief Engineer Dredging.

Q.—You can only give information so far as dredging is concerned ?

A.—Yes.

Q.—What is the date of your appointment ?

A.—It is about the beginning of August 1923.

Q.—Dredging did not start until November 1923 ; so you have been here for the whole period of the dredging operations ?

A.—Yes.

Q.—Therefore you know everything in connection with the working of the dredger ?

A.—Yes.

(The witness produced a plan marked ' C. R. B. 1 '. On being asked he showed on the plan the position of the dredging area.)

Q.—This is the place where dredging was done in the first season ?

A.—Yes, dredging was done here in the first season and also during this last season when the " Colaba " was being stiffened.

Q.—Have you got a map showing by cross-sections level of the dredging done ?

A.—No such plan exists.

Q.—This plan shows the depth you went ?

A.—This shows the depth of the material dredged.

Q.—What do these red ink figures show ?

A.—They show the depth from the surface of the bed of sea.

Q.—It does not give depth at the high water ?

A.—No.

Q.—Have you got that information ?

A.—You can get that from Kidd's borings only.

Q.—Can you put in the other map the surface reached by Mr. Kidd ?

A.—This map was given to me by Messrs. Meik and Buchanan for my personal information and I cannot spare it.

(It was decided to get the map from the witness and return it as soon as done with.)

Q.—Can you explain to me what these red figures refer to ?

A.—On the left hand end of the plan this information is given. The top figure in the circle denotes the surface of the sea bed, I mean the top figure inside the circle. Where there are three sets, the middle figure the top of the blue clay.

(The witness then showed the area denoting rock and hard moorum.)

Q.—Is there nothing to show how far the borings went into the clay ?

A.—No. The upper figure indicates the top of the blue clay, the second figure the top of the hard bottom or bottom of the borings.

Q.—I can only assume that the bottom figure indicates the bottom of the clay. What I want to ask is whether these borings were actually taken to a certain distance into the clay. Here is a case which means that boring was actually taken 10 feet into the clay ?

A.—Yes, about 10 feet into the clay.

Q.—So that according to this, borings were actually made into the clay until they came to moorum or rock as the case may be ?

A.—Yes.

Q.—Here we have got 47 feet from the sea bed and the bottom of the blue clay ? How is it that the top level was the surface of the sea, and the second level was the surface of the top of the clay ?

A.—Where there are three levels, the top indicates the level of the soft mud, and bottom level indicates the bottom of the borings.

Q.—It means that there is no record kept of the depth of soft mud ? One of the objects was to find out the level of the clay ?

A.—Yes.

Q.—What does this dotted blue line indicate ?
A.—That shows the restricted area.

Q.—Do you know how these borings were made ?
A.—I understand, but I have no official information, that they were taken by wash borings.

Q.—Is that how they were all done ?
A.—They were all done like that.

Q.—Is there any means of proving that ?
A.—I cannot say. The machines were all dismantled when I came here.

Q.—What is this clay, hard, soft or unctuous ?
A.—I do not call it genuine clay.

Q.—Why not ?
A.—Because it is more consolidated silt.

Q.—The clay you showed me on the other day, was that good clay ?
A.—Some of it.

Q.—The piece you showed me ?
A.—Not all of that. Some of it contained too much mud and silt.

Q.—You never put wash borings through clay such as that ?
A.—I have not done any wash borings myself.

Q.—Have you ever seen it done ?
A.—No.

Q.—Have you heard of it being done ?
A.—Yes, the Development Directorate did it.

Q.—Which individual did it ?
A.—I have forgotten his name but it was done in Mr. Lewis' time.

Chairman.—We want full particulars of all the borings made in Back Bay. He made a reference to them at page 47 of 'Correspondence regarding the execution of the works'. (It was decided to call for particulars from the Development Directorate.)

Sir F. Hopkinson.—Can you tell me the amount of dredgeable material within that area?

A.—I have not calculated that area. I have calculated that the amount of material available is sufficient to fill various areas in Back Bay and I have indicated that on the plan.

Q.—Is it sufficient to fill all areas ?
A.—Yes.

Q.—Nos. 1 and 2 also ?
A.—Yes.

Q.—Have you got a plan showing the position in which each block is to be taken and the position of the dredger in so working ?
A.—Yes.

(Witness produced a plan marked "C. R. B. 3.")

Q.—You produce a plan showing the area that would be used for filling the various reclamation areas. Can you say that block K, for instance, is going into block 7 ?
A.—I have numbered the areas.

Q.—Block 8 is now finished ? You have not to pump anything more into it ?
A.—No.

Q.—Area 7 is that corresponding to block 7 ?
A.—Yes.

Q.—Areas numbered on the dredging area correspond to the numbers of the blocks in the reclamation ?
A.—Yes.

Q.—No provision is made for filling blocks 1 and 2 from the harbour ?
A.—No.

Q.—Can you tell me the maximum distance dredging will have to be pumped ?
(The witness showed that on the map.)

Q.—Has it ever been discussed how blocks 1 and 2 were going to be filled from the harbour ?

A.—No ; not within my service.

Q.—Why did they get another dredge to work in Back Bay ? Was it realised that "Sir George Lloyd" could not possibly do the work ?

A.—I understand the other dredger was not intended for the Back Bay reclamation but for the east Colaba reclamation and as she was available for work in Back Bay, she was put to work there.

Sir M. Visveśvaraya.—By the other dredger you mean " Kalu " ?

A.—Yes.

Q.—When it was taken to work in Back Bay, was any work at Colaba done ?

A.—No.

Sir F. Hopkinson—Do you know if Sir George Buchanan ever told you how he was going to fill blocks 1 and 2 from the harbour ?

A.—He never said that to me.

Chairman.—Did Sir George Buchanan in any of his visits say how he was going to fill blocks 1 and 2 ?

A.—On his first visit after my appointment we discussed the Back Bay dredging, and decided to do it with the " Kalu ".

Q.—That was an entire alteration from the original scheme ?

A.—Yes.

Q.—It was not contemplated when the original 1919 scheme was drawn up ?

A.—I believe not.

Q.—Did you see the letter of the 22nd June 1921 written to Mr. Lewis by Sir George Buchanan ?

A.—Yes.

Q.—Do you see that he says there that they have always held that there is rock in Back Bay, in many cases near the surface, that it would be impracticable to use a suction cutter dredger on a large scale ? To fill 1 and 2 you will have to pump in material on a large scale ?

A.—I do not think that is a large scale.

Sir F. Hopkinson.—It is nearly 5 million cubic yards.

A.—I do not consider that a large quantity.

Sir F. Hopkinson.—It is a fifth of the total.

Q.—Later on in the letter, so firmly does he feel that a cutter dredger will not be efficient to use, that he says you may get a considerable quantity of material by means of a grab dredger loading into barges. Does that strike you as a practical engineering scheme to fill in 5 million cubic yards ?

A.—It depends largely on the size of the grab dredger he had in mind and the size of the buckets.

Q.—Would you call it a practical scheme ?

A.—I do not call it impractical.

Sir F. Hopkinson.—In dealing with 5 million yards in two years ? A graber's output is what ?

A.—About 200 yards a day for a grab dredger.

(*Sir F. Hopkinson*—That is 50,000 a year. Therefore it is one hundred years to do blocks 1 and 2.)

Q.—Is that calculation right ?

A.—The calculation of course is right.

Q.—In a grab dredger you have to the material out of the barge and to put it into the reclamation. It can only be deposited out of the barges up to a very small level, and therefore it is not a practical scheme ?

A.—Not by that means.

Sir F. Hopkinson.—What other means would you adopt ?

A.—I have not given it a thought. I would not adopt the grab method at all.

Chairman.—Now Mr. Brims, give plenty of thought. Sir George Buchanan says you might get a considerable quantity of material in buckets by means of a grab dredger loading into barges, but that the cost would probably be very heavy. Are you going to suggest to this Committee the use of a grab dredger to fill blocks 1 and 2 as a reasonable engineering proposition ?

A.—No, I do not consider it so.

Q.—Who selected that site in Back Bay for dredging ?

A.—I selected that.

Q.—How did you select it ?

A.—I took some prickings. I was there the first few days myself, and then my Assistant Engineer took the others working on the same line I showed him.

Sir F. Hopkinson.—Did you map out a certain area with buoys ?

A.—Yes, where I wanted a pricking taken.

Q.—Did you map out an area and mark it by buoys ?

A.—No.

Q.—What did you do then ?

A.—I had a buoy put down at a given point. And I had that checked while I was there and I saw it checked myself.

Q.—That is to locate it ?

A.—Yes. And I told them to take prickings from that point at the same points as the washborings had been taken.

Q.—So you had washborings taken before that ?

A.—Yes, I thought you were aware of that.

Q.—No, why did you select that site ?

A.—Washborings had been taken prior to my appointment by the Development Directorate under the Chief Engineer. That was at the end of 1922 and the beginning of 1923.

Q.—In his letter dated 1st May 1922 to Buchanan Lewis says, " We have got fairly good results, but I am afraid the plant we improvised is not powerful enough for anything at all hard ". Would you not call that clay ? Why did you want anything too hard for the dredger to cut ?

A.—I am rather under the impression he had moorum in his mind.

Chairman.—There is another letter dated 22nd June 1921 where he says " We hope there would be a great deal of hard clay that would require very little moorum topping ". He was wishing for hard clay ?

A.—Yes.

Q.—And then he says, " It seems to me we might get better results by grabbing out instead of trying to make wash borings ". Does not that phrase of Mr. Lewis satisfy you that they never had at this date made any washborings worth reporting ?

A.—I do not think, on that date, but I am not certain on that point.

Q.—In the letter dated 1st May 1922 he says, " Another alternative for boring would be etc., etc. " Is it not evident that on the 1st May when this letter was written they knew little or nothing about the sea bed of Back Bay ?

A.—I consider so.

Q.—On the 10th May 1922, Mr. Lewis is again writing to Meik & Buchanan, " Borings have been taken over that bed. These show there is a layer of sand and clay .....averaging about nine feet in depth over the whole area. We have not been able to penetrate this to fully investigate the possibilities of its being workable by the dredger . " Does it not appear to you that they knew very little about the nature of the sea bed in Back Bay and the feasibility of dredging from that sea bed ?

A.—Yes.

Sir F. Hopkinson.—Have you got dredging material in Back Bay, that is, material suitable for dredging over that area shown in red lines ?

A.—Yes.

Q.—And this portion shown is the portion you have already done.

A.—Yes.

Q.—Is the quantity 4 million cubic yards ?

A.—Yes.

Q.—What do you get there, rock, or moorum or what ?

A.—Both.

Q.—Did you attempt to dredge either of them ?

A.—Yes, we did attempt to dredge moorum, which is necessary to get flotation for the dredger.

Q.—That is very important ?

A.—Yes.

Q.—Is there water enough for the dredger to float ?

A.—No, there was only about two to three feet of water.

Q.—Is there not a risk proceeding to have a dredger worth about two lakhs of pounds taking ground in low water.

A.—I insured that we would have flotation for the dredger.

Q.—If you come on a point of hard material, you won't be able to have initial flotation ?

A.—We would try to dredge it away. If we could not, we would not have.

Q.—I should like to see all particulars of the borings you have there. You have got them ?

A.—Yes.

Q.—Can you fix the date when it was decided to start dredging in Back Bay ?

A.—I believe it was in the beginning of 1924.

Q.—Had you at that time a detailed survey of the borings and the material you were likely to get in that area ?

A.—Yes, the washborings taken prior to my appointment.

Q.—That only deals with mud and light silt. They won't go down into hard clay. Had you anything but these washborings ?

A.—No.

(*Chairman.*—We must have those washborings that were handed to you.

A.—I can show you my personal copy, but I have got a lot of other correspondence on this file. That is a copy of the information I made out before I came out in 1923.)

Q.—What is the total depth ? Is that below the surface ?

A.—Yes.

Q.—Does this mean here that you went 16 feet through soft material, sand and soft clay and 16′-1″ to 21′-6″ in hard clay ?

A.—Yes.

Q.—If you went through soft clay, it means you had a boring, not a washboring ?

A.—Yes, it was washboring.

Q.—Did you make the washboring ?

A.—No, it was made before my appointment.

Q.—Again I should like to have the man who made those borings. Do you know who made these washborings ?

A.—They were made in Mr. Lewis' time. I presume Mr. Thomas, the Executive Engineer, Projects, made them.

Q.—Do you know his address ?

A.—Yes, he is still in the office, Old Customs House.

Q.—According to this plan you should approximately have 4 million yards in this rectangle shown in dotted lines, which is nearly enough to make up blocks 1 and 2. These quantities shown in blocks 1 and 2, are they the total quantities ?

A.—Yes.

Q.—So there is enough material in the area, assuming you can dredge it ?

A.—Yes.

Q.—Do you think you can ?

A.—Yes, but I cannot guarantee it.

Sir M. Visvesvaraya.—Why don't you take actual sections again so as to be able to guarantee it ?

A.—I have. I have taken prickings. They vary. They give 7′, 9′, 18′, 14′-9″, 11′. In one place here it is 14′-1″.

Q.—That proves one thing definitely, that the material is soft ?

A.—No. It was a two-inch pipe, and it was with the weight of a 30 cwt. pile driving monkey the pipe was pushed to a certain depth.

(*Sir F. Hopkinson.*—That is different.)

Q.—Can you tell me how much did the material in Back Bay cost per cubic yard to dredge during last season ?

A.—Rs. 1-3. That is the actual working cost exclusive of office administration.

Q.—Does it include repairs to dredgers ?

A.—We made certain repairs and paid for it during this season for damage incurred during the previous season. They were ordinary running repairs.

(*Mr. Billimoria.*—Anything for depreciation ?

A.—No.)

Sir F. Hopkinson.—That was without a booster ?

A.—Yes.

Q.—The booster would cost nearly thrice as much next season ?

A.—No, I do not consider it will. I have got some approximate figure.

Q.—It cannot double itself ?

A.—I anticipate the dredger will improve.

Q.—As a consequence of using the dredger ?

A.—On account of my having found recently an area of suitable material.

Q.—Of course the booster would cost nearly as much as a dredger ?

A.—Yes.

Q.—The cost of Rs. 1-3 is practically the cost of the dredger only. Do you not think dredging for the next year will cost you twice as much ?

(*Sir M. Visvesvaraya.*—I understood him to say it will take $\frac{3}{4}$ of this.)

A.—Yes, I hope to get it down to below a rupee per cubic yard.

Sir M. Visvesvaraya.—I want to see every detail in connection with that. Could you give details to show how you got that figure of 12 annas ?

A.—Yes.

Q.—What do you hope to get it down to ?
A.—To 12 or 13 annas.

Sir F. Hopkinson.—That is about a third of what it cost you last year allowing for the extra use of the booster. Do you think you are going to do the work at a third of the last year's cost ?

A.—I think I am going to considerably increase the output of the dredger.

Q.—What was the output last year ?
A.—It was nearly 373,000 cubic yards.

Q.—How much per pumping hour ?
A.—381 cubic yards.

Q.—Of course on the surface it is capable of improvement. But who has the details of those costs ? You or the Accounts Department ?
A.—I have in my office.

Q.—So that you can show me the entire cost for last season in detail ?
A.—Yes.

Q.—And I should like at the same time to know what the cost of the administration is, the real actual cost, not a percentage.
A.—Yes.

Sir Frederick Hopkinson.—I have got some figures about the daily working cost of the dredger, but as I have not got the details I cannot understand it. I suggest that you and I have a meeting so that we may go into it in detail.

A.—Yes.

Sir M. Visvesvaraya.—The Development Director has given Re. 1·3 as cost.

Sir Frederick Hopkinson.—That is two shillings. It is much more expensive than the Back Bay.

Sir M. Visvesvaraya.—Anyhow these figures should be checked and verified.

(The Committee then proceeded to an examination of the maps.)

Sir Frederick Hopkinson.—How many pipes have you got ?
A.—We have two at present.

Q.—(Looking at the map) What about No. 3 ?
A.—It is at the south end of the Wodehouse bridge.

Q.—Is the cost reasonable ?
A.—The only difficulty is it is over the causeway.

Chairman.—Is it not yet used ?
A.—No.

Sir M. Visvesvaraya.—No. 1 ?
A.—Is in use.

Q.—No. 3 ?
A.—Has not been used.

Q.—No. 2 ?
A.—Has not been laid.

Q.—Three were intended originally ?
A.—Yes.

Q.—Have you any idea as to cost ?
A.—No.

Sir Frederick Hopkinson.—What is the length of pipe line No. 2 ?
A.—About two thousand and two hundred feet.

Sir M. Visvesvaraya.—How is it that No. 2 comes beyond No. 3 ?
A.—I cannot say.

Q.—Probably in order of construction ?
A.—It may be.

Sir Frederick Hopkinson.—That is quite a considerable work ?
A.—It has to go over the B. B. & C. I. Railway.

Q.—Have you got permission to take it over the railway ?
A.—No. The only difficulty will be crossing the Colaba causeway and the B. B. & C. I. Railway.

Q.—It is quite a considerable work. Have you any idea as to cost ?
A.—No.

Q.—You had nothing to do with the ordering of any of the dredging plants ?
A.—Nothing.

Q.—You have frequently seen the dredgers when at work. Has Sir George Buchanan been frequently seen at the dredgers ?
A.—Yes.

Q.—How much time did you spend there ?
A.—On the occasions on which he went about an hour on the dredger, not counting the time on the floating pipe line.

Q.—How frequently did he visit the dredger when he was out here ?
A.—There has been no note, but I think it was about two or three times a week, or rather twice a week would be a fair average.

Q.—Was he very disturbed about the output of the dredger "Lloyd"?
A.—He appeared to be very disturbed.

Q.—Did he suggest any means for improving the output ?
A.—Yes.

Q.—In what way ?
A.—He suggested that we were trying to dredge too hard material, and that we should confine ourselves to soft material.

Q.—Silt or clay ?
A.—He did not explain himself further.

Chairman.— Did you not ask him what he meant ?
A.—He merely said soft material.

Q.—You could easily have asked him what the soft material was ?
A.—I did not ask him. I thought it referred to soft clay and silt.

Q.—Is that all ? Did he suggest that you should go and try to find out some soft material ?
A.—I made no notes of them.

Q.—You should have been taking particular note of what he said ?
A.—I do not think that he professed that he is an expert on handling a dredger.

Q.—Did he ever say to you "Now Mr. Brims, acting on my advice and the advice of the naval architects and builders we have had supplied a dredger that we say and contend is capable of delivering two thousand cubic yards an hour. Mr. Brims, why can't you do that ?" Did he ever say that to you ?
A.—Not in those words.

Chairman.—But substantially ?
A.—I said that the material was too stiff.

Sir Frederick Hopkinson.—What did he say to that ?
A.—I am afraid I cannot remember those words.

Q.—Did he ever say to you "I will do it myself; if you cannot do it, somebody else must be found" ?
A.—No.

Q.—Was he satisfied with your explanation ?
A.—Yes.

Q.—You should remember he had two seasons' work, and of course you know, as well as everyone else, that the success of the whole scheme depended upon this one matter. Do you think it possible to get two thousand cubic yards an hour ?
A.—Yes, but not for any length of period.

Q.—How long ?
A.—You might get it for as long as a month.

Q.—Two thousand yards an hour working how many hours a day ?
A.—Working for twenty-four hours a day.

Chairman.—Do you mean you could get forty-eight thousand cubic yards in twenty-four hours ?
A.—Yes, we can get on an average two thousand cubic yards per hour for a period of a week or possibly a month.

Q.—Under what conditions ?
A.—Working twenty-four hours.

Q.—Then you would get forty-eight thousand yards each working day ?
Sir Frederick Hopkinson.—Probably it means the working capacity of the machine ?
A.—It was meant for two thousand yards an hour in soft clay.

Q.—You know the working amounted to sixty-four per cent. of the total. How could she do two thousand yards an hour when she stopped for more than a third of an hour ?

A.—I am not going to actual results.

Sir M. Visvesvaraya.—Did you ever work continuously for twenty-four hours here ?

Sir Frederick Hopkinson.—Did he ask you to work twenty-four hours a day ?

A.—Yes, before I came out here. I said that it was my intention to work twenty-four hours if possible.

Q.—Do you think it possible to work twenty-four hours a day ?

A.—No, I do not think.

Q.—Did you ask any one to work twenty-four hours a day and with what result ?

A.—I said it was impossible.

Q.—Why ?

A.—At that time we had one dredging master or Superintendent, and no assistants.

Q.—That is a detail. You could get men ?

A.—At that time we had only one dredging master.

Mr. Billimoria.—How many shifts would you require if you work for twenty-four hours ?

A.—I think it would be advisable to work twenty-four hours with two shifts.

Q.—With men working for twelve hours continuously ?

A.—Yes.

Q.—Under the Factories Act, are people allowed to work for twelve hours continuously ?

A.—I do not think it comes under the Factories Act at all.

W.—You asked me about the possibility of working twenty-four hours. During last year we were working only eighteen hours a day and we did 1,821 cubic yards per pumping hour for one week.

Sir Frederick Hopkinson.—Is it after making allowance for stoppages ?

A.—This is the actual time the pump was run as distinct from working time.

Q.—According to what you say now, does it really come to 48,000 cubic yards in twenty-four hours ? Your 1,821 cubic yards makes no allowance for the ordinary temporary stoppages ?

A.—It does make an allowance ; because it is the pumping time only.

Q.—If you are working twenty-four hours, you have only got twenty-four pumping hours *minus* thirty-six per cent.?

A.—Yes.

Q.—Thirty-six per cent. is approximately a third, therefore you have got only sixteen pumping hours of 1,800 cubic yards, *i.e.*, less than 30,000 cubic yards a day ?

A.—Yes.

Sir Frederick Hopkinson.—But you are not working twenty-four hours. What are you prepared to do next ?

Chairman.—Government will settle how many hours you should work. You have not got the power to say how many hours you are going to work, have you ?

A.—I have not.

Chairman.—You have never approached 2,000 cubic yards an hour, have you ?

A.—That I am not in a position to say.

Q.—Have you any record here to show that at any time you ever touched 2,000 cubic yards per pumping hour ?

A.—There is no record showing that.

Q.—Have you any recollection of having done so ?

A.—No.

Q.—What is your average of pumping result for the last year, in terms of filling ?

A.—Filling has nothing to do with dredging work.

Q.—What is your record for the last season ?

A.—960 yards per pumping hour is the average for the whole season.

Sir Frederick Hopkinson.—That is the actual pumping hour setting aside necessary delays ?

A.—Yes.

Q.—Why do you say that you can do 2,000 yards per hour ?

A.—For a short period.

Q.—You say for a month ?

A.—We have already done 1,800 cubic yards per pumping hour.

Q.—For how long ?
A.—For a week.

Q.—Why cannot you do it for six months ?
A.—Because the material is not uniform.

Q.—Does your record satisfy that you have done 1,800 cubic yards per pumping hour ?

Sir Frederick Hopkinson.—You are doing only half on the average ?
A.—Yes.

Q.—Is it because your dredging masters are inefficient or are neglecting their work that they can do only half of what you expect them to do ?
A.—The dredging masters do not neglect their work.

Q.—How is it that they do only half ?
A.—It is on account of the variations of material and also on account of the human element. One man will be able to get 2,000 of this material, while another man under the same conditions will possibly not even get half.

Q.—Did you ever explain that to Sir George Buchanan ?
A.—I have explained it to so many people, but I am not prepared to say that I explained it to him.

Q.—Did he ever complain about your inefficiency ?
A.—He was satisfied that we have done all that we could possibly do.

Sir M. Visvesvaraya.—You have introduced the human element into the case, and you are of opinion that, whereas one man would get 960 cubic yards to the working hour another man might be able to do 2,000 cubic yards with the dredger. Did you ever represent that to Sir Lawless Hepper ?
A.—I think I have.

Chairman.—If such a man could be got, he was worth any money. Did you ever make an attempt to get such a man ?
A.—I have been trying to get, but I have not succeeded.

Q.—Have you ever written any note to Sir Lawless Hepper on that point ?
A.—No.

Q.—Or to anybody ?
A.—No.

Chairman.—You see the importance of this. If you knew that under the best conditions of last year you had an average of 960 cubic yards per working hour, if in your own mind you thought that the human element entered into it, if you believed that with this dredger you could get a man who would produce 2,000 cubic yards, why did you not bring it home to the Director of the Development Directorate ?
A.—I can only deal with my immediate Chief.

Q.—Who is your immediate Chief ?
A.—Mr. Elgee.

Chairman.—Have you written any memorandum to Mr. Elgee about it ?
A.—No.

Q.—Have you consulted with Mr. Elgee with regard to getting somebody to get more out of the dredger ?
A.—No.

Q.—It is very highly important that you have got a man who will get the best possible results out of the machine. Do you agree ?
A.—I agree.

Q.—What is the technical qualification of this man ? Was he trained ?
A.—He is an assistant dredging master.

Q.—Who is above the assistant dredging master ?
A.—Dredging Master.

Q.—You say the type of man you want is a man to fill the post of assistant dredging master ?
A.—Who is known generally as dredging master.

Sir Frederick Hopkinson.—You see the importance of it if you could double the output of the dredger ?
A.—Yes.

Q.—Instead of costing $3\frac{1}{2}$ per cubic yard it would be 3 per cubic yard which would make all the difference between the scheme being a success or a dire failure ; therefore you see the importance of the point ?
A.—Yes, I see the importance of the point.

Q.—That is what I want you to bear in mind all the time. The dredging has nothing to do with the filling ?

Mr. S. B. Billimoria.—Have you anybody who would do the work according to your expectation ?

A.—I have not. Each man will have to be tried out.

Q.—Have you anybody in view ?

A.—I have nobody in view without trying him.

Q.—It is a hypothetical proposition ?

A.—Yes.

Chairman.—Take the cost per cubic yard, one man working a great deal more skilfully than another. There is the human element. One man will know exactly how the cutter should be adjusted so as to take the full bite. In that way, a man who knows just how to adjust the speeds in relation to the cutting will get a bigger output than a man who is unable to adjust in relation to face to the face to be dredged, that is what you mean ?

A.—That is what I mean.

Sir Frederick Hopkinson.—The cutter has no difficulty in cutting the clay ? Has it ?

A.—You are referring to the harbour which is different from the back bay.

Q.—Is there any difference between the two ?

A.—There is not the same quantity of hard clay.

Q.—That is, it is harder work in the back bay ?

A.—Yes ; it is harder work in back bay.

Q.—There is no difficulty with the cutter in the harbour ?

A.—Not in the harbour.

Q.—It can cut quite readily in the back bay ?

A.—Not quite readily.

Q.—If the dredger were run faster ?

A.—No ; I think it has got sufficient power and speed. I do not wish to make that statement as a statement made by an authority on machinery.

Q.—You ought to be an expert now ; you have had three years' experience.

A.—What is three years ?

Q.—It is a great deal.

A.—It takes ten years to train a dredging master.

Q.—To know whether a cutter has power or not ?

A.—I consider it requires much experience.

Sir Frederick Hopkinson.—There is no reason why she should not do the work for which she is designed, as far as cutting is concerned ?

A.—She was not designed to cut 2,000 yards per hour in this clay.

Q.—What was she designed for ? There is the statement of Sir George Buchanan in June 1921. He said he hoped to do with a great deal of hard clay in the harbour. So he knew that his dredger would deal with it quite readily.

A.—Nevertheless, I understand that the dredger was designed to dredge 2,000 yds. per hour of soft clay.

Sir M. Visvesvaraya.—What makes you think so ?

A.—From the correspondence I have seen.

Sir Frederick Hopkinson.—You have told me that you do not want to increase the power of the cutter, you do not want to increase the steam ; therefore it is the machine for the purpose ?

A.—Yes.

Q.—Why is it not doing it ? You have not got 2,000 cubic yards per hour.

A.—I consider that with the dredger designed for 2,000 cubic yards, I have got to get perhaps three to four thousand cubic yards per hour, so that the average will be 2,000.

Q.—But your average is only 964 for the last season ?

A.—Yes.

Q.—I do not know what you mean by " that the cutter has no less power, it has got a plenty of speed " ; and yet you are not getting half of what it is designed to ?

A.—It may be that I am wrong in saying that it has got the power and speed.

Q.—You are giving me your experience. Surely you could have come to a definite conclusion ?

A.—I have come to a definite conclusion that this dredger is not capable of pumping 2,000 cubic yards per hour for six months in this material. We may be able to do it for a month.

Chairman.—You say for six months, in this material ?
A.—Yes ; in this material.

Q.—Is it because the material would give out or the dredger would give out, which ?
A. Neither ; because the material is too stiff.

Sir Frederick Hopkinson.—Where is your office, Mr. Brims ?
A.—Old Customs House.

Q. That is near the dredger ?
A.—That is midway between the Back Bay dredging and the Harbour dredging.

Q.—Have you ever been criticised unfavourably by Sir G. Buchanan about the methods of doing the dredging ?
A.—Never.

Q.—Do you see from anything he said that he was dissatisfied with you or any of the staff ?
A.—Never ; but the opposite. He was quite pleased that we were doing everything that we possibly could.

Q.—That must be a very satisfactory view. What is your programme for the next season ?
A.—To pump into No. 7 area through pipe line No. 1.

Q.—When will the dredger be ready for pumping ?
A.—About the middle of October.

Q.—And the 'Colaba' ?
A.—About the same time.

Q.—You have not finished the necessary repairs to the 'Colaba', have you ?
A.—No.

Q.—How long will they take ?
A.—I am afraid I cannot say definitely ; it may be in a few weeks we can have it finished.

Q.—Who is advising you as to the amount of the stiffening necessary for the 'Colaba'.
A.—Captain Phillips, R. I. M.

Q.—What is he ?
A.—He is Engineering Captain.

Q.—A sea-going captain ?
A.—Yes, he has been in the dockyard as chief engineer.

Q.—Is he an architect ?
A.—Yes ; I think so. He and Mr. Williams, the constructor in the dockyard, advised us.

Q.—They have advised you ?
A.—Yes ; in addition to that, the Mazgaon dockyard advised us.

Q.—What did they advise ?
A.—They have not come to any decision yet regarding the actual details.

Q.—You do not know yet what is necessary to be done ?
A.—Not in detail.

Q.—Broadly ?
A.—Broadly, yes.

Q.—What is it ?
A.—To rerivet the foundation of the pump where necessary and possibly some additional stiffening. That is a point which has to be decided yet.

Q.—Has the engine got a governor on it ?
A.—Yes.

Q.—I presume you are a mechanical engineer and you would see to its working ?
A.—The Chief Engineer would see to its practical working.

Q.—You say that the rivets might have become loose because the pumping plant could not be driven at a proper speed ?
A.—I do not say that they have not, but that is a possible reason.

Q.—If the rivets come loose, is it not an indication that something is seriously wrong ?
A.—Yes.

Q.—Well, how long has this been going on ? Has it been going on for three seasons ?
A.—She was not working in 1923-24. The "Colaba" has been working two seasons.

Q.—When did the vibration occur?
A.—First season.

Q.—What is done with it?
A.—Stiffening was put along on the top of the deck.

Q.—Who advised that?
A.—It was suggested by myself that "Colaba" did not have this on and the other dredger had that; it might be that is what is required to stop the vibration.

Q.—Did it not do it?
A.—It did not do it.

Q.—It stopped work in the first season for seventeen days?
A.—No; in the second season; we had practically no loss owing to vibration in the first season.

Q.—What is the condition of "Colaba" in the second season?
A.—It did not answer the purpose.

Q.—When did it vibrate again?
A.—During the second season.

Q.—Did it vibrate to any serious extent?
A.—To a very serious extent.

Q.—So serious that you had to stop working for seventeen days?
A.—Yes.

Q.—What was done to cure the defect?
A.—Plate girders were fixed to the bottom of the ship by experts.

Q.—Did that cure it?
A.—It did not cure it but it enabled us to control it.

Q.—What do you mean by 'control it'?
A.—By increasing or decreasing the revolntions of the engine as may be required.

Q.—Did stiffening enable you to do that?
A.—Stiffening enabled us to do that.

Q.—How?
A.—I am not able to answer it; I cannoi explain it; but it did enable us to do it. In some states it may be vibrating badly; by increasing the revolution it stopped.

Q.—Did it vibrate at low water or high water?
A.—To begin with, in the first season, it was from about half tide to high water and back to half tide that it vibrated most.

Q.—The vibrations showed first when it was doing less work? Have you any idea as to how that would be?
A.—It might be a small load on the engine; it may have been driven too fast.

Q.—I am not speaking of what might have caused it, I am speaking of what was the cause?
A.—I am not able to find out myself.

Q.—It is a mystery?
A.—It is more a mystery to myself; I am not a naval architect.

Q.—You know that pumping is harder in the low tide?
A.—I cannot say the reason for the vibration.

Q.—To continue the programme, when do you propose to put it to work?
A.—About the beginning of November.

Q.—When are you going to test it?
A.—As soon as possible.

Q.—Where have you kept the "Jinga"?
A.—It was on the spot from the commencement of the last season.

Q.—The "Jinga" will have a great deal to do?
A.—The "Jinga" will not be put in until the "Kalu" has re-dredged the hole and gone further ahead.

Q.—So the "Kalu" will have very little to do?
A.—It will have a shorter line to discharge through.

Q.—Never more than a 1,000 feet?
A.—More than that; about 3,000 ft. she will have to pump through.

Q.—Is the "Jinga" ready to work?
A.—No.

Q.—When will she be ready?
A.—I hope to have her ready in about two months.

Q.—Are you making any extensive alterations to the Jinga ?
A.—No alterations, but re-conditioning.

Q.—What is re-conditioning ?
A.—Putting in a new pump and plates.

Q.—That is an extensive alteration ?
A.—Not so ; I do not call it an alteration ; we will keep the same design and arrangement of machinery.

Q.—You take the whole pump-body and put in a new pump-body.
A.—Yes. That is costing us about 1,000 £.

Q.—Will you have all the papers ready for me to go through regarding the detailed cost of the dredging. I have got some figures from you, but I do not understand the daily average cost. I want all the details to see how you have arrived at them ?
A.—I do not know what you exactly want.

Q.—A practical business man wants certain results. I want to know how you got Re. 1 3 as. per cub. yd. I want every detail regarding it.
A.—Yes.

Q.—Have you made an estimate of what is going to cost to run the ship for the ensuing season.
A.—Not yet, because I am waiting to complete my figures for working 24 hours as against working 18 hours.

Q.—You have not been working it till now ?
A.—I have been working 18.

Q.—How long ?
A.—Last season.

Q.—The whole season ?
A.—The whole season.

Q.—It has not been mentioned.
Chairman.—You say you have been working eighteen hours a day. But from the eighteen hours you make a reduction of 34 per cent., which strikes off six hours to make the necessary arrangements to get the machine ready to begin to pump ?
A.—Not necessary to begin to pump.

Sir Frederick Hopkinson.—Q.—You really have been working eighteen hours ?
A.—Yes.

Q.—But the result is only twelve pumping hours ?
A.—Yes : eleven hours twenty-four minutes.
Q.—I shall be very interested to know what you propose to do in the working for twenty-four hours, and what output you expect to get ; you will let me have a copy of the figures in the next fortnight.
A.—Yes.
Q.—I understand that the Colaba has got two propelling engines and a separate engine for working the main pump ?
A.—Yes.

Q.—Can you tell us what the propelling engines are for ?
A.—For navigation.

Q.—It is usually for navigating away to the spot at the beginning of the season and back at the end of the season ?
A.—Yes.

Q.—Why should you require two propelling engines for that particular purpose ? Why would not the ordinary engine answer the purpose ?
A.—It would.

Q.—Then the propelling engines were quite unnecessary except for getting round ?
A.—Yes.

Q.—It has not got separate boilers, but only separate engines ?
A.—Yes.

Q.—Have you any such thing on the Lloyd dredger ?
A.—It is identical, with the exception of a cutter-gear and a hoist-gear.

Q.—Is it possible that one was intended to be a substitute for the other ?
A.—No ; it cannot be. The Colaba is shorter in length. She would have to be extended.

Q.—She could not take the place of the dredger ?
A.—No.

Q.—The Colaba pumps as much as the George Lloyd ?
A.—I think so.

Q.—Will you tell me whose original idea it was to put the Kalu into the Back Bay ?
A.—I believe it was originally proposed by Mr. Lewis.

Sir Frederick Hopkinson.—Was Mr. Lewis anything in the way of a dredging expert ?
A.—I am afraid I am not in possession of any information.

Sir M. Visvesvaraya.—I want you to repeat some of the statements you have made to Sir Frederick Hopkinson. What is the quantity you have dredged in the last season with the aid of George Lloyd ?
A.—18,28,303 cubic yards were actually removed from the harbour.

Sir M. Visvesvaraya.—What is the quantity of dredging in the last year done by "Sir George Lloyd "?
A.—18,28,300.

Q.—And with the "Kalu", twenty-two lakhs ?
A.—Yes.

Q.—What was the total expenditure of dredging during the year for twenty-two lakhs ?
A.—The total expenditure was 14,50,000, that is for Back Bay and the Harbour combined.

Q.—You added twenty-two lakhs of cubic yards ?
A.—Yes.

Q.—That is two-thirds of a rupee practically ?
A.—I keep Back Bay and the Habour separate.

Q.—The totals come to fourteen lakhs ?
A.—Yes.

Q.—At what rate did you do the Harbour excavation.

Chairman.—Taking them jointly seven-elevenths of a rupee.

Sir M. Visvesvaraya.—What other charges have to be added to this in order to get the total cost ?
A.—Depreciation, interest charges on capital expenditure, office administration of my own office, Chief Engineer's Office, Secretariat.

Q.—But these are not added to the cost you have given ?
A.—No. It is the actual working cost.

Q.—Have you got any figure as to what percentage you have added to the fourteen lakhs ?
A.—No.

Q.—What do you take as depreciation on the value of the machinery ?
A.—I have not taken any depreciation.

Q.—As a professional man what would you take ?
A.—I am not in a position to say. I don't know the figures supplied by the Development Department.

Q.—What is the life of the plant ?
A.—That is rather a difficult question to answer put in that way. The life of a plant depends on the amount of expenditure incurred each year on re-conditioning. If I am allowed to re-condition and keep a vessel like the "Sir George Lloyd" in first class order, there is no reason why that dredger should not last for ten, fifteen or twenty years.

Q.—That is rather indefinite ?
A.—It depends entirely on re-conditioning each year.

Q.—At the end of ten years, what would you get if you sold the dredger ?
A.—I am not in a position to say.

Q.—You did last year twenty-two lakhs of cubic yards. How much do you hope to do in the coming year with improved working ?
A.—I hope to increase that by 25 or, if possible, 50 per cent. if I work twenty-four hours a day.

Q.—Why should you not work twenty-four hours a day ? It is possible to work twenty-four hours in three shifts. Considering that the output is so small, it seems necessary to try ?
A.—I do not consider it economical.

Q.—Economical in what respect ?
A.—We are doing nothing for six months in the year. You have got to maintain a staff for doing nothing. You have got to pay for three shifts instead of two.

Q.—Can't you discharge them in the months they are not doing anything ?
A.—Discharge the best men ? They would very soon go back to Karachi or somewhere else. We would have to train fresh men for the work.

Q.—How do you employ these men ?
A.—We are employing them on a certain amount of re-conditioning and repairs to the dredging craft, and the men who are discharged are the crews.

Q.—So, you expect to do about three million cubic yards next year roughly?

Sir Frederick Hopkinson.—Do you anticipate doing three millions next year?

A.—We did one million and odd.....

Q.—You are speaking of one dredger only?

A.—One dredger.

Sir M. Visvesvaraya.—He is now speaking of both. He hopes to do three million cu. yards.

A.—Yes. I hope to increase it by 25 or 50 per cent.

Q.—What are the encouraging features in your working for the next season?

A.—The men are becoming more experienced every year.....

Q.—That is important?

A.—And would be working twenty-four hours.

Q.—With these additional facilities you will be able to do three million cubic yards next year?

A.—Yes.

Q.—Kindly tell me based on your experience of the last year at what rates you expect to work the Harbour dredging and that of the Back Bay per cubic yard? May I remind you of the figures you gave us?

A.—I have not worked all these out. It is also dependent upon twenty-four hours working. There is no use in working out a mass of figures.

Q.—You must assume something, you cannot leave things indefinite?

A.—I am working it up now to put before Government.

Q.—Last year Harbour dredging was done at the rate of twelve annas a cubic yard. At what rate in the coming year are you going to do it? I want a general idea. You are not committing yourself.

A.—Might be for eight or nine annas, but I don't wish these figures to be taken as binding. I am speaking without figures now.

Q.—In the case of dredging from the Back Bay the rate last year was Rs. 1·3 per cubic yard. What do you, with your experience, expect to reduce it to?

A.—Somewhere in the neighbourhood of a rupee.

Sir Frederick Hopkinson.—I forgot to ask you the cost of the Harbour dredging for the last year. Of course, again, I want all the details.

A.—I have got all the details of expenditure for each month. The cost of Harbour dredging was 8·7 annas a cubic yard.

Sir M. Visvesvaraya.—Is that on the basis of 28 lakhs?

A.—Yes.

Q.—What is the difference between 12 annas and 8·7 annas due to?

A.—Well, it may be due to material, different conditions, different men, etc.

Q.—You say 8·7 annas was the rate per cubic yard of dredging last year, but the rate given to us by the Development Directorate was 12 annas. What is the difference between these two figures due to?

A.—I am afraid I do not know. I do not know what have been included in it. It is quite possible it may include depreciation and overhead charges, and interest charges may be included.

Q.—Supposing you had your own way, what would be your programme for the coming year? You will start the work in October?

A.—We will start work in the middle of October, pumping into area 7. That would take us all the season.

Q.—You will fill in Block No. 7 in the Back Bay?

A.—We would begin pumping through pipe line 1.

Q.—That will be partly finished during the season?

A.—Yes.

Q.—What method of measurement do you adopt for gauging 2,000 feet of cubic yards or 900 cubic yards of pumping per hour.

A.—We take the position of the dredger each day at the same time or approximately at the same time and take soundings.

Q.—The depths?

A.—The depths and from observations we were able to calculate how much the dredger had moved, etc.

Q.—Have you got the quantities originally said to be available from the Harbour and the quantities now actually available by the refusal of the Port Trust and the Royal Indian Marine?

Chairman.—All those figures have been given.

Sir Frederick Hophinson.—He told me he had ample material.
A.—I had no trouble about the material.....

Sir M. Visvesvaraya.—You have sufficient material for all time?
A.—If I consider I have got sufficient material, I don't worry.

Q.—You have taken soundings. Are you depending on the original soundings or have you taken any soundings yourself?
A.—I depend on Mr. Kidd's soundings for information.

Q.—Don't you think it wise to take fresh soundings?
A.—I don't think it is necessary. Mr. Kidd's soundings are sufficiently accurate for the purpose.

Q.—Is it necessary to pump from the Back Bay, if you can get all the material you want from the Harbour?
A.—If we don't pump from Back Bay we can't fill in areas 1 and 2 without having possible shore boostering.

Sir Frederick Hopkinson.—He means by that that the plant as designed is not capable of filling in blocks 1 and 2 from the Harbour.

Sir M. Visvervaraya.—Is the cross wall ready for No. 7?
A.—No.

Q.—When is it going to be made ready?
A.—I am afraid I do not know. But I presume before the middle of October.

Q.—It will take some time to do.

Sir Frederick Hopkinson.—About your dredging in the Harbour, what depths of mud....?
A.—That depends entirely on the class of material for dredging.

Q.—No cutter required?
A.—We did require it in silt. The sand would run, but mud won't run.

Q.—Will you kindly tell me who can tell me what the depth of cut in clay is?
A.—The Dredging Master. He is coming here.

Q.—What is his name?
A.—His name is Mr. Girdwood. He is more competant to say. I may give a wrong impression.

Sir M. Visvesvaraya.—Why were the three pipe lines not laid as originally designed across the Peninsula?
A.—The pipe lines were laid as and when it was considered they were required.

Q.—Only one had been used, the other has been laid and the third has not been attempted?
A.—Yes.

Q.—You have not made any specific attempt to find out the quantities available in the Harbour and in the neighbourhood of the work in the Back Bay respectively?
A.—In the Harbour I accept the figures that have been furnished to me.

Q.—Accepting is one thing. You have not made any special surveys yourself?
A.—Not beyond what the dredger has done.

Q.—Will it cost you very much to make sure of this?
A.—In Back Bay I have done so because the information which I had didn't prove to be correct: When I attempted to put the dredger in, the dredging didn't prove to be correct. Therefore I took other observations.

Q.—But it won't cost very much to make quite sure whether you can get sufficient quantities in each case?
A.—It would not cost thousands of rupees, but why spend Rs. 50 unnecessarily.

Q.—But you are spending Rs. 3,000 in interest charges alone. which is nothing compared to this.
A.—I am satisfied that the information of Mr. Kidd is sufficiently accurate.

Q.—Do you happen to know why the Colaba reclamation was abandoned, and "Kalu" taken away from there?
A.—That is a point with which I am not concerned.

Q.—What is the capacity of the "Kalu"?
A.—The "Kalu" has been designed for 2,000 cubic yards per hour of pumping through 4,500 ft. of pipe.

Q.—Almost the same as "Sir George Lloyd", 1,500 feet with a 39″ diameter pipe.

Sir Frederick Hopkinson.—Is it more difficult..... ?

A.—Because material was too hard. There was only one small area where we had sufficient soft material.

Sir M. Visvesvaraya.—Is the combined working of "Sir George Lloyd" and "Kalu" likely to give three million cubic yards in the next season ?

A.—Yes.

Q.—You are fairly confident ?

A.—I have every hope.

Q.—Do you think that with the improvement of working you will be able to get even better results after a year hence ?

A.—There is a limit to improvement.

Q.—Can you give us statements giving in a brief form the cost of working of the dredgers and also the cost during working hours, the cost of repairs, special stores and all that ? Can you give us all those details ?

A.—I have a statement here of the cost showing the monthly expenditure under wages, stores, fuel, water-supply, repairs and renewals, and for sundry payments. I have taken out per cubic yard. (Witness handed in a statement.) It is in rupees.

Q.—Can you give us the cost month by month throughout the last season as well as the total output ?

A.—It is quite possible to do that.

Q.—Have you taken sections at sites ?

A.—Sections have been taken over the area.

Q.—Have you taken measurement of the pumping ?

A.—Yes. The measurement was very much in excess of the quantity required from the Harbour.

Sir Frederick Hopkinson.—Have you considered that water is being mixed with silt ?

A.—Yes, it is bulking.

Q.—Have you dried the stuff ?

A.—We have measured and taken sections. There is a lot of water we know. But the amount.....

Q.—It is still in the process of settlement ?

A.—It is still.

Q.—You are going to adopt three shifts from next season ?

A.—No. I do not wish to work three shifts.

Q.—And why not, considering that time is money ?

A.—I am considering working two shifts for twenty-four hours.

Q.—Will the men possibly hold out ?

A.—I think so. The great point is if the men will be willing to work it.

Mr. Billimoria—Do you think it possible without break-down, working for twelve hours ?

A.—It is not possible to work for any considerable period without a break-down.

Sir M. Visvesvaraya.—Speaking generally, you think that the plant is not up to expectations, because of the clay and clay only ?

A.—That is the principal one.

Q.—Are there any other factors which contributed to it ?

A.—Yes.

Q.—Will you kindly mention them ?

A.—One is the human element. We have got men who are trying to do their best.

Q.—Are they efficient ?

A.—The majority of the men have to be trained here.

Q.—What other defects ?

A.—There is the question of weather during the working season.

Q.—You can't see any possibility of working in the Harbour during the monsoon ?

A.—Impossible to work during the monsoon.

Q.—And what other factors have contributed to the failure ?

A.—I have given : the material, the human element, the weather.

Q.—You say, with an estimated average of 2,000 cubic yards per hour at the rate of fifteen hours a day for 170 days, you don't get that output ?

A.—No. I have mentioned the principal reasons.

Q.—They must have taken all that into consideration ?

A.—They ought to have.

Q.—Then, is it not usual when a plant is not working satisfactorily to ask the manufacturers themselves to send out a man to demonstrate its capacity ?

A.—I cannot say whether that is usual or not, because I have never hitherto had a plant which did not give satisfaction.

Q.—This is the first time that you have had that experience ?

A.—The first time.

Q.—Do you hope to improve the results by more..... ?

A.—I hope to improve the results considerably as the men get more experienced.

Q.—If a plant is designed to work to a certain capacity, is it not usual for the owners to ask the manufacturers to send down a man to prove to the satisfaction of the owners that it is giving the proper output ?

Chairman.—That is what the Government of Bombay did. They wrote to Buchanan and asked him to arrange for a representative of the firm who supplied the dredgers to come out here and show why the dredger was not giving its output. There was a letter to that effect sent to Buchanan.

Sir M. Visvesvaraya.—You know the form in which the results of the working of the dredgers is usually given ?

A.—Yes.

Q.—Could you give us in that form the cost ?

A.—Yes, I have got my cost.

5th Witness

Mr. W. H. Neilson, Chairman, Bombay Port Trust

Chairman.—In reply to a letter from Mr. Ewbank, you wrote to him on 30th July 1926 :—

" With reference to your letter of the 28th instant, I shall be happy to give evidence before the Back Bay Committee as desired by them. With reference to the points on which the Committee desire my opinion :—

(1) the circumstances under which the Port Trust prohibited dredging operations in certain areas are explained in the preambles to the Trustees ' Resolution Nos. 712/1921 and 111/1911, copies of which are enclosed for information. The relative plans are doubtless available for inspection on the records of the Development Directorate ;

(2) the only experience which the Port Trust has had of suction dredgers was the dredging carried out in the Harbour between the years 1909—13 by the suction dredgers " Jinga " and " Kalu " in connection with the Mazagon Sewri Reclamation..... "

You have given the text of the letters which passed between the Port Trust and the Director of Development and the advice tendered by the Port Trust solicitors.

The actual position was that eventually for reasons which were good to the Port Trust they prohibited dredging over a certain area ?

A.—Yes.

Q.—That area taken in conjunction with another area which the R. I. M. objected to, reduced the original proposed area by some 15½ millions cubic yards ?

A.—I cannot verify that figure. I have not gone into it.

Q.—In his letter sent by the Chief Engineer (Mr. Lewis) to the Director of Development (Sir Lawless Hepper) he says " the reduction of material available due to exclusion of the area to the North of the Pencil Line on the chart sent by the Port Trust amounts to 8,280,450 cubic yards. The reduction of material, if dredging is limited within the naval anchorage, to 35 feet below low water ordinary spring tide amounts to 7,292,466 cubic feet or both together to 15,572,896 cubic yards. "

Without your having any personal knowledge of these figures, is that approximately the area which you have in your mind as being the extent to which the dredging was prohibited ?

A.—The area is given on the plan.

Q.—These are the figures of which the Development Directorate believe they were deprived ?

A.—Yes.

Q.—Of course as regards the Port Trust property whatever you said the Development had to obey ?

A.—Yes.

Q.—And as regards R. I. M. if they raised any doubts as to the safety of anchorage or anything of that kind, the Development Directorate had to obey their requirements ?

A.—Yes.

Q.—When that portion was prohibited, was another portion allowed ?
A.—Yes, to the south.

(The witness explained the whole position on the map.)

Q.—It means the new area involved the use of a longer pipe line ?
A.—No. Not longer than they originally proposed working.

Q.—In point of fact they decided to work in Back Bay ?
A.—They decided to work into Back Bay because I think they found difficulties in filling block No. 1 from the harbour.

Sir Frederick Hopkinson.—You said you could not get below that area ?
A.—It was no use working on rock. It was all rock.

Q.—What is the datum.
A.—The datum is 100.

Q.—The datum being one hundred, low water spring is seventy-two.
A.—There is a difference in lowest ordinary spring and low water ordinary spring.

Q.—Seventy-two you say is the lowest ordinary spring tide ?
A.—Yes. The mean sea level is 0·5.

Q.—On page 1 of your report you say that 'the data on which the revised estimates were examined are necessarily scanty' ?

Mr. Neilson.—You are referring to the report of Engineers.

Sir M. Visvesvaraya.—The full report is not before us.

A.—So far as we are concerned, we sent all to Government. I think it is all there.

Chairman.—This document seems to be quite complete.

Sir F. Hopkinson.—Am I right in assuming that this is the report of the Committee of Engineers whom Government asked to revise the estimates ?
A.—Government appointed a committee of engineers for revising the estimates which are mentioned in the *ad interim* report of the Advisory Committee and to look into the estimates which were to be framed in the light of the working season which the Development Directorate would frame again.

Q.—What were your terms of reference ?
A.—They sent the terms of reference to us in April last and the estimates came only on 24th or 26th of June. When the Committee looked into them, they found that the Estimates referred to portions of work at blocks 1, 7 and 8 and then wrote back to Government and pointed out that this did not comply with the terms of reference. They were revised and refer to blocks 1 and 7 only.

Q.—So you were asked to verify only two estimates ?
A.—Yes, under the revised terms of reference.

Q.—It does not deal with block 8 ? How much material is required for it ?
A.—There is no estimate for it.

Q.—You say the data on which the revised estimates were examined are necessarily scanty. What do you base your estimates on ?
A.—On the figures given by the Development Directorate. They worked three seasons; in one nothing was done. In the harbour dredging they worked three seasons. It is only in the last season, in both the harbour and back bay that we were able to base our estimates.

Q.—Did Government want your opinion on these costs to know whether they were reliable ?
A.—Yes.

Q.—These figures were reliable or actual costs ?
A.—They were actual costs.

Q.—Did you go into the details then, I mean the cost of labour, oil, fuel, plant, etc.
A.—The Committee did not check the figures of Estimates supplied by the Development Directorate. They were supplied by the Accounts Officer.

Q.—Therefore there was nothing for you to do but to form an opinion as to whether succeeding works would be successful or cheaper ?
A.—They wanted us to check the Estimates.

Q.—Did you check them yourself ?
A.—We revised them.

Q.—So there was nothing original. I want to know exactly how it was done ?
A.—We saw both the dredgers at work and examined blocks 1 and 7.

Q.—Do you think it possible to improve upon the output of the dredgers ? Did you inspect them closely ?
A.—We want to see how the dredgers worked.

Q.—Out of curiosity.
A.—We went in order to see whether the dredgers were working easily or not.

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Q.—What conclusion did you come to ?
A.—It was not working easily in the Back Bay.

Q.—Do you think it could be improved upon ?
A.—That depends on the material it is dredging. I do not think it could be done.

Q.—Were you satisfied in which the dredger was working ?
A.—I think it could not be better.

Q.—Were you satisfied with " Kalu " ? Were she working all right ?
A.—They were working all right and I do not think they can work the dredgers better. They had to work on a hard material.

Q.—Have you any experience of suction dredgers ?
A.—Yes. I had six years at Karachi, eight years at Chittagong and then at Calcutta.

Q.—You are then an expert in dredging ?
A.—I do not think I am. I have had about twenty years dredging experience in dredging in India.

Q.—Don't you think that sufficient to make you expert.
A.—I do not think myself to be an expert ?

Q.—In your position I would claim to be an expert ?
A.—I have not specialised in it.

Chairman.—He says he has a good experience, examine him on that.

Sir F. Hopkinson.—We have been told by Sir George Buchanan that the dredgers have been mishandled. We want to verify it.

A.—I do not think so.

Q.—Do you think 36 per cent. an unreasonable amount for various things besides actual pumping time. I mean the time required for minor repairs, ordinary movements, etc.?
A.—You are taking that percentage on the actual working hours. There will be certain number of hours when the pumping is not done and again there are certain days when she is laid up.

Q.—Let us take a fixed period. Out of 100 per cent. she had to do 66 per cent. and 34 per cent. were occupied in getting her into order, floating the pipe line and in such small matters before she begins to pump.
A.—You want working of one season.

Q.—We want your opinion whether this proportion of working hours is reasonable, let it be in any season.

For instance I give you the results of the working of the dredger during 1924-25 :—

	Per cent.
Pumping time	64·1
Adjusting pipe line	3·9
Adjusting pipe dredger	6·9
Extending floating pipe line	3·1
Engine room repairs (Sir George Lloyd)	1·4
Engine room repairs (Colaba)	3·0
Pumping water only (clearing water)	2·7
Minor repairs	8·5
Delayed by heavy swell	1·5
Repairs to floating pipe line	4·9

All that works up to 100 per cent.

A.—I think that is quite reasonable.

At Karachi the figure varied between 12 per cent. and 33 per cent. We had to work in heavy sand, oyster shell and very hard stuff.

Q.—Sand was the hard stuff ?
A.—Yes.

Sir F. Hopkinson.—If you were told that some one has designed a dredger for you to pump 2,000 cubic yards an hour, and that it would work a certain number of days and a certain number of hours and give an output of five million yards a year, I presume you would take it that all these have been allowed for ?

A.—I would.

Q.—In the original construction of the dredger it is supposed to work 170 days, and 15 hours a day at 2,000 yards an hour, which gave a total of five million one hundred thousand cubic yards per season. That is impracticable, is it not ? No allowance seems to be made for this loss of 36 per cent. It seems to be assumed the dredger was not going to lose any time at all ?
A.—Yes.

Q.—There is bound to be a loss of 36 per cent. over that total?

A.—That I should call a minimum loss.

Q.—That reduces the possible output of the dredger from five million to three million a year?

A.—Yes.

Q.—Could you tell us what are your dredging costs?

A.—We were doing a double job in Karachi, which was satisfactory. We were dredging and reclaiming at the same time. The length of the pipe line was not very large. We had not a boosting station, and I do not think the length ever went up to 5,500.

Mr. Billimoria.—You carried some of the stuff in barges?

A.—No, not in the suction dredger. That was in the bucket dredger.

I am talking about the year 1918–19. It was As. 11·2 per ton including depreciation and interest. The figures vary each year. That year it was very good.

Q.—You say here on the 2nd page that the material contains silt in suspension. That ultimately will settle?

A.—I hope so.

Q.—You have no idea how much is likely to diminish until the time it settles?

A.—That of course is one of our difficulties.

Q.—You have not made any experiments?

A.—Yes, we observed it. We lost about 50 per cent. This material bulks a lot. They were dredging silt and clay, and that all bulks greatly. These figures were taken just after the dredging was finished. There was no evaporation.

Q.—Fifty per cent. seems to me a very high figure. With regard to your experiment would you mind explaining just what you did?

A.—We took an earthen vessel filled with this material from the reclamation and allowed it to evaporate. We threw off the surface water and left it to dry, and it went down 45 per cent. and even then you could put a pencil into it.

Q.—Did you take the water off as it arose?

A.—No.

Sir M. Visvesvaraya.—Could you put in perforated wells to draw off clear water and pump it?

A.—You could do it, but then you should have a fine sieve.

Q.—The Chief Engineer thinks your estimate of one thousand six hundred hours per season too low. He estimates two thousand hours?

A.—I do not know why he thinks so.

Q.—Do you think twenty-four hours' work a day a practical proposition?

A.—I should like to try.

Q.—The Chief Engineer thought of driving them by two shifts of twelve hours each.

A.—I think it can be done, but I don't think you will get double the output.

Q.—With your wide experience of dredging do you see any reason why it should not be attempted?

A.—No, not in a large scheme like this.

Q.—You have got the accounts here. The cost, taking a harbour section, comes to 8·46 annas a cubic yard, and allowing 20 per cent., the cost will be 10·57. These are the figures given to you.

A.—Yes.

Q.—Further on you say you take the moorum topping as twelve inches thick. Is it possible to put only twelve inches of moorum?

A.—If they let it dry sufficiently they can do it.

Q.—They cannot put it on now?

A.—No.

Q.—Therefore you are assuming here that they will let matters stand until the dredged material solidifies sufficiently?

A.—That is their estimate.

Mr. Billimoria.—What is the moorum filling in the Sewri-Mazagaon Reclamation?

A.—There in the Mazagaon-Sewri Reclamation it was not identical. There was a very deep bed of clay and silt underneath. There was a depth actually of over fifty feet. Here they are filling on rock.

Q.—Was it enclosed?

A.—Yes, with a stone wall.

Q.—Would you be justified in taking only twelve inches of moorum here?

A.—It depends on how you want to do it.

Q.—As to this Sewri Reclamation I see you lost about 24 per cent. of your dredging material?

A.—It is more than that. The loss comes to about 33 to 53 per cent. I know the mistake you refer to. Arithmetically it comes to 25 per cent. These figures were taken after the

dredging was finished and before moorum was put on. We put in five feet instead of twelve inches of moorum. So we had another ten lakhs of brass filling in addition. If you allow for that you get the increased percentage.

Q.—Complaint was made that dredging material escaped through the wall. Did you see any of that ?

A.—I did not go down to observe it. I do not know. Of course if the thing was not sealed, it might have run through.

Q.—The cost of moorum filling has been taken by the Development Department at so much per brass. You adopt that figure except you add 15 per cent. for shrinkage. You know how the prices were arrived at ?

A.—They give details. There is no reason to suppose they were incorrect. I adopted those figures.

Mr. Billimoria.—You assume the material comes from Kandivli quarry. Suppose there is no material left there. Would the cost remain the same ?

A.—I should not think so unless they opened out a quarry of their own.

Q.—Otherwise it would cost much ?

A.—It would not cost very much more if they took a large quantity.

Q.—You say the dredger went searching about. Why should she go searching about? Did they not select a place for her to work ?

A.—Yes.

Q.—Then why did they have to search ?

A.—She had to take a long time to find her flotation.

Q.—So it had not properly been surveyed in the first instance ?

A.—It might have been. They took borings.

Q.—Without knowing where to find flotation you would not take a dredger costing a thousand pounds ?

A.—I would not dredge in the Back Bay at all.

Chairman.—Would you speak a little more slowly? This is rather important. You have told us about the Kalu searching about for a suitable place to dredge, and you had her under daily observation ?

A.—I was not personally in charge.

Q.—You were interested in it ?

A.—Very, when she settled down to it. It is all in the Development records. It was in December.

Q.—If you were going to do a work like that, would you not first of all make a survey and take borings in the places where the dredger might work ?

A.—The success of a scheme of this nature depends upon preliminary observation naturally.

Q.—Would you not make proper borings as preliminary observations in the Back Bay?

A.—I should in the first place have very great doubt whether I should take any borings at all. It is very shallow, and it is extremely doubtful if you will get any really definite good results.

Q.—And therefore all the more necessary to take borings and soundings ?

A.—Yes, to take a considerable number. And also you are held up again by these cables.

Q.—You would make arrangements about these cables before you took the dredger there ?

A.—Yes.

(*Sir M. Visvesvaraya.*—That was done.)

Q.—That was probably one of the reasons why the dredger was searching about ? They could have been buoyed off.

A.—They were buoyed off.

Q.—Your cost of working the dredger you put at Rs. 1·33 per cubic yard, or Rs. 1–8–0 with 20 per cent. wastage. But that did not include the cost of the "Jinga" ?

A.—No, it does not. It is the cost of working. It includes the cost of repairs which are mentioned as running expenses.

Q.—There is something I do not understand on the last page. You say there Rs. 1 per cubic yard equals Rs. 4–14–0 per brass ?

A.—It is a mistake. It ought to be Rs. 3–11–0 per brass. It is my mistake.

Q.—What does your moorum filling come to ?

A.—It comes to Rs. 1·56 a cubic yard.

Sir M. Visvesvaraya.—What were the results of your investigation, and what was actually accomplished by your committee ?

A.—It is fully explained in the report.

Q.—Is the report limited to these four pages ? I was under the impression that a separate report was submitted, I may be wrong.

A.—They are all here.

Q.—You refer to the rate of lorries at Rs. 2–8–0 per brass at the last page. Where do you get your filling from?

A.—That is immaterial. The Development Directorate, I think, have arranged to get it from the Improvement Trust.

Q.—Is there any chance of getting a very large quantity from that source?

A.—No.

Q.—Have you gone into the rates for moorum filling?

A.—I have taken what they have given me as correct for their quarry.

Q.—I want this information to check the rates with those of the quarry.

A.—I do not think you will get it cheaper than that.

Q.—If the rate from the quarry is 1·56 and the rate by dredging is ·75, would you wait for the filling being done entirely by the dredger or would you also mix up dry filling and carry on both side by side?

A.—The rates which you have given are not comparable. You have to add your depreciation and any rolling stock if you want to compare dry filling with dredged filling.

Q.—Suppose you take 25 per cent. for the plant as proceeds of sale at the end of the work?

A.—No, you must take what you can get.

Mr. Billimoria.—There is a small dredger at Mumbra which cannot be sold. Do you think there will be any bids for the "Sir George Lloyd" in view of that?

A.—It all depends on whether there is anybody in the market. For that dredger, which is certainly a small one, there is probably no demand. I know they wanted one at Vizagapatam. It is impossible to say whether there will or will not be a demand.

Q.—What would be a safer basis, to write off the value as depreciation?

A.—It would not be an over-estimate if we put its worth at 5 per cent. of its original value.

Q.—You write off 95 per cent.?

A.—If you work it to death, 5 per cent. would be its scrap value.

Sir M. Visvesvaraya.—The dredger will be used here only for seven or eight years, and so we will have to take depreciation into account.

Q.—*Witness.*—Do you think it will be finished in seven or eight years?

A.—*By Sir M. Visvesvaraya.*—If we do not finish in that time, the interest charges will swallow up the whole thing. The interest charges alone come to about 6 or 7 thousand a day. It will not pay to keep it on for a longer period.

Sir M. Visvesvaraya.—Have you considered what the cost would be if filling were brought across the harbour in barges? Will the reclamation be faster if this were done?

A.—It is not practicable.

Q.—It may not be practicable. But what would be the rate per brass?

A.—You cannot get them on to the site.

Q.—You cannot get the barges there? It won't do to bring them from the other side of the harbour. It won't pay.

A.—No, no. There are limits to what you can do.

Q.—Have you any changes to suggest in the method or organisation of the work from your knowledge of the work? You must have thought of these questions very often. Also have you any suggestions to make about the dredger or about the methods of filling or any additions or improvements in the present system of working?

A.—That is a very wide question indeed.

Chairman.—Take it this way. Suppose the matter were put into your hands to-day. What would you do? Would you carry on on the same lines or is there any alteration which you would suggest?

A.—To take the situation as it is, you have spent about one and half crores in dredging plant, and if you do not go on with the dredging, you must drop most of it. The question is, what is the best thing to do. I certainly think that one should go on slowly block by block and see the result, and consider whether anything more can be done. I should proceed very slowly.

Q.—But what about interest charges?

A.—Well, you have spent the money, you have got to pay it back.

Q.—Would it not pay to complete the middle blocks sooner than you intend?

A.—It might not pay you, because as you are spending a lot at present, supposing you fail to sell after a time your interest charges will be considerably higher than they are to-day.

Q.—What would be the rate to be got per square yard at the Marine Lines end and the Colaba end, if put up for sale?

A.—That is a difficult thing—what rate we can get?

Chairman.—What rate would you anticipate to sell land per square yard in blocks Nos. 1 and 5?

Sir M. Visvesvaraya.—Assuming that the whole area will be completed within a reasonable time, what will it fetch? We want some rough estimate to go on with as business men.

A.—I will deal with the actual value of the land in Bombay, and see how it varies. It would not be the same value in every block. In Marine Lines it will be high. They want some two hundred rupees on this side of Queen's Road. That will give you some idea.

Q.—What is your idea?

A.—The value is of course at rock bottom now. I should think it would be worth anyhow Rs. 120.

Chairman.—That is for building purposes?

A.—Yes.

Q.—Recreation grounds?

A.—No. I am talking about business quarters and four storied buildings.

Sir M. Visvesvaraya.—The Municipalities have to pay for the playgrounds. What will be the average rate?

A.—It may vary between Rs. 50 and Rs. 250.

Q.—From your study and investigation of the quantities put in last season, what quantity do you think the dredgers would yield next year, working under favourable conditions?

A.—I have stated 4½ lakhs at this end and 12 lakhs at the other end.

Q.—Seventeen lakhs, is that all?

A.—That is consolidated.

Q.—If the Engineer says that he expects to do 3 million next year, would you not trust his judgment?

Chairman.—Mr. Neilson's opinion on the hopefulness of a witness will not help us much. We must talk among ourselves whether their hopeful figures are likely to be realised.

Sir M. Visvesvaraya.—You think it will not go above 20 lakhs next year?

A.—Of consolidated material? I have given the figures already.

Q.—The rates that you have worked out might hold good for other areas also?

A.—No, only for blocks 1 and 7.

Q.—You have no idea of the rates for the remaining blocks?

A.—Where the pipe line dredger is put in the Back Bay is a different proposition to the harbour.

Chairman.—Have you gone into the question of numbers 2, 3, 4, 5 and 6?

A.—No, I have not.

Q.—You would give a rough average for the two ends. Supposing your advice was sought, what are your general recommendations for the future about the scheme?

Q.—Are you going to go by the opinion of witnesses?

Sir M. Visvesvaraya.—You are a gentleman on the spot having knowledge of the details and you know the local conditions?

A.—As I said before, I would go cautiously. I would finish No. 1 and think about it before the end of the next season.

Q.—Several other witnesses have been saying that the whole thing should be completed at once. Do you agree?

A.—No, I do not agree.

Chairman.—We shall decide in our own minds which we prefer.

Sir M. Visvesvaraya—You have no advice to give about any changes in the organisation or administration of the works or the working of the plant?

A.—No.

Mr. Billimoria.—Do you think that the restricted area did not materially hamper the Development Department?

A.—No, certainly not.

Q.—I believe, Mr. Neilson, that you have seen Sir Alexander Gibb's report. Do you differ from him when he discards the dredging and gives preference to dry filling in blocks numbers 1 and 2?

A.—His report was made out before the resnlt was known of last year's dredging season. He would probably change his opinion when he has got the figures of the last season.

Q.—You do not entirely agree with his conclusion that it would be more economical to have adopted dry filling in the case of certain blocks?

A.—No.

Q.—When the scheme was embarked upon were you at all consulted by the Development Department or by Government ?

A.—No, I was not consulted. Of course this matter has been going on for some time in fact from 1903.

Q.—It was very well known all over that you had considerable experience of reclamation, and in spite of that no authority ever cared to consult you or have the benefit of your experience ? Sir George Buchanan never approached you about it ?

A.—No.

Q.—Do you know on what basis he prepared his estimates ?

A.—No.

Chairman.—If you want the date, the estimate was finished by September 1919. He was employed on it during the summer of 1919 and he gave it to the Government in October 1919.

A.—That is the 367 lakh estimate.

Sir M. Visvesvaraya.—Do you know that Mr. Kidd was making borings in the Port Trust area about 1912 ?

A.—Yes.

Q.—Did you then object to that ?

A.—The Port Trust raised no objection.

Q.—Why was objection raised at a later stage ?

A.—The taking of borings and the preparation of schemes are two different things. When your schemes affect the harbour we have to say no.

Q.—Do you still hold that if dredging was allowed, it would have endangered the property of the Port Trust or the harbour ?

A.—Oh, yes.

Q.—You asked Government to indemnify those losses before they could start any operation within that restricted area ?

A.—No, no. We asked Government to indemnify us against any result which might be effected by dredging the habour.

Sir Frederick Hopkinson.—Was it a very wide indemnity ?

A.—Yes.

Sir M. Visvesvaraya.—In what way ?

A.—They were in very wide terms intended to cover all anticipated loss. That indemnity was drafted and was accepted by the Development Department.

Mr. Billimoria.—I now wish to ask about the Kalu, the Port Trust property which was sold to the Munitions Board. Before you sold it, at what price did you hold it in your books ?

A.—I cannot give you the book value, but I can give you the price we sold it for. (Mr. Billimoria said " we know she was sold for £75,000.")

Q.—Have you got any other figures ?

A.—The capital cost of the Jinga and Kalu was 28½ lakhs and the sale proceeds were 8 lakhs.

Q.—Government paid £75,000 for the Kalu alone ?

A.—We sold ours before the boom in prices.

Q.—You realised 7 or 8 lakhs for the Kalu and the Jinga. You got a bargain price. Is it a fact that the value in your books was very much lower and that you were very pleased to get this amount ?

A.—I cannot tell you that, Mr. Billimoria, I am not quite certain.

Mr. S. B. Billimoria.—You were not displeased with the figure 8 lakhs ?

A.—You take what you can get. If you have not got any work in view.

Q.—Did any one make enquiries from your department before purchasing this " Kalu " particularly ?

A.—She was examined by a mechanic.

Q.—By the Munitions Board ?

A.—By the Development Department. I think so. She went up to Basra ; as she did nothing she came back here, and it was then that the Development Department purchased it. Of course they had it examined mechanically.

Q.—So it was reported upon that it was quite a good bargain at £75,000 ?

A.—I cannot tell you that.

Q.—Did she yield satisfactory results when she was being worked by you ?

A.—I think so.

Sir Frederick Hopkinson.—The dredging was extremely inadequate for the price paid for it.

A.—Yes ; it varies from one job to another. Conditions are different in Back Bay.

Mr. S. B. Billimoria.—I shall now ask you a general question, if you do not mind. If a project is placed before you for consideration, would you not exhaustively go through the estimates and, after making allowances for contingencies, say whether it is productive or not?

A.—I certainly would, Mr. Billimoria. I certainly would take steps to see that it is properly scrutinised.

Q.—Would you only look at that proposition from an engineering point of view or would you also consider the financial aspect of it?

A.—I would look at it from every point of view.

Q.—In your own opinion, if the scheme was estimated to cost 367 lakhs and the revised estimate gave a figure of 702 lakhs, which was subsequently increased to 1,100 lakhs, would you consider the scheme as financially sound?

A.—I should have very grave doubts about its financially being sound.

Q.—If you are at the head of the Finance Department, what line of action would you suggest to the Government to take in view of the estimates having materially gone up by 300 per cent.

A.—These are all general questions.

Q.—You have had such a vast experience, and you have seen the project working for five years?

A.—I have not had any similar experience of such excesses.

Sir M. Visvesvaraya.—You take a sort of professional interest in the scheme?

A.—Undoubtedly.

Q.—You must have some definite views also?

A.—I never thought it was a dredging proposition at all.

Sir M. Visvesvaraya.—You are coming somewhat nearer.

Mr. S. B. Billimoria.—You believed that this would not be a success?

A.— I heard about it when I was at Karachi, and I knew when I was in Bombay that it was not a promising proposition. I did not know sufficiently about the details but it was a sort of instinct.

Q.—That belief of yours has been more than confirmed after looking at the results as we see them today?

A.—To a certain extent. The scheme is not a new one, and the question of sea wall was started many years ago.

The Chairman.—It was in 1863, and ended by failure of Asiatic Banking Corporation.

A.—Yes.

Mr. Billimoria.—It is something like history repeating itself, and the Chairman now draws attention to the history of the sixties. People had burnt their fingers before; and now Bombay had gone into it.

Now, to our purpose. You have had occasion to purchase cement for various works?

A.—We purchase cement regularly.

Q.—Could you give the highest price paid between 1920 and 1925? English or Indian cement?

A.—Delivered at site?

Q.—Yes.

A.—I could let you know. But I cannot tell now.

Q.—As a prudent business man would you enter into long term contracts at high prices, when prices are soaring high, or buy just enough for your requirements and wait and watch the market?

A.—You are referring to the times when the prices are fluctuating. I should certainly not make a long term contract.

Q.—What is your experience of the Ballard estate? You know that people have burnt their fingers there. The blocks are still vacant; that is a fact that cannot be denied by anybody.

A.—I think I can deny it. It is a general statement. My impression is that some people have been wrong there. There was one gentleman who leased two properties at extremely low figures; he was ruined, but he was not ruined by the Ballard estate; he was ruined by other means. On the other hand there were speculators who took advantage of people wanting ready money and selling buildings for very low prices on the Ballard estate and they have not made as much as they hoped to get. Generally the prices are not high. You would not get them now, they would be higher.

Q.—Because it is a business locality?

A.—Yes; it has become the centre of gravity of the shiping business.

Q.—As a rule, all business localities realise much better prices.

A.—For the net building area.

Q.—Not the open spaces.

A.—No ; that does not count. I say generalities are so incorrect ; nobody has heen ruined through getting a building on the Ballard estate.

Q.—You know that the foundations are giving way in some of these places. There are rumours that there are cracks in the Ballard estate buildings, and foundations are sinking. Has that come to your notice as Chairman of the Port Trust? Has anybody complained about it?

A.—They cannot well complain, because it would be on the wrong path ; they cannot complain because they own the buildings ; I know instances where in one particular building the corner has gone down ; that was on a raft ; there are cracks in some others ; that is due more to bad building than anything else.

Q.—In all the buildings that were built on the Ballard estate, which was a reclaimed area, pile driving was almost necessary.

A.—Yes.

Q.—Pile driving was a costly business?

A.—Yes.

Q.—It makes a tremendous difference to the public or the contractor ; if he is to drive piles on loose foundation it becomes more costly?

A.—Yes ; it depends on the size of the building.

Q.—How long would it take for actual land to settle down in a reclaimed area, for instance Mazgaon reclamation ? We find in some instances, even to-day, the land is going down. At Cotton Green the land going down. Has not that been complained of?

A.—No. It is not sinking.

Q.—Other parts of it?

A.—Surely yes ; in the Mazgaon reclaimed area.....

Q.—How long will it take for land to settle down in a reclaimed area? How long will it take between a building being built and the site being got ready?

A.—You are talking of dry filling or dredged filling?

Q.—Dredged filling. How long will it take for land to settle down?

A.—I really do not know. I do not think once you get moorum that it will settle very much more except you put a heavy weight on it. If you build over a large area it will burst some time. That is our experience. But you cannot build on dredged filling, except a very light building.

Q.—What I want is how long will it take for the land to settle down and what time you allow between the land being ready for building purposes and the date of commencing building operations?

A.—Not very long ; one monsoon may do it.

Q.—What would be the moorum top filling? 12 inches.

A.—I do not think so. It will be something more.

Q.—5 feet.

A.—I should think 5 feet, except where the dredged filling is not very deep, it may be less than 5 feet. In Mazgaon Reclaimation the depth is very great.

Q.—From your experience, can you tell us if the owner of a property will accept a net return of 6 per cent. in these days when he can get that interest on Government securities?

A.—I think so.

Q.—That would mean a gross return of 9 per cent., with municipal taxes, depreciation, etc.?

A.—I should think so.

Q.—Do you think there would be hundreds of people flocking in to take up this 22 lakhs square yards of reclaimed area expecting to get 9 per cent. return?

A.—The application for land is not like the case of a gold reef. It is slow to start with. If there is demand for land, it increases of its own accord. People are attracted by the very fact that other people have gone there. It will be a slow start.

Q.—It will take years for all the 22 lakhs to be sold?

A.—Yes.

Q.—Is it likely that you will find many tenants coming forward paying a monthly rental of Rs. 450 for a flat in that area? Will there be 300 new tenants coming forward. Is Bombay so prosperous as that?

A.—I have not been here long.

Q.—Do you think the estimates that Sir Alexander Gibbs has adopted in his report are more or less accurate? Even there your figures materially differ from Gibbs'?

A.—I cannot say whether the estimates are accurate or not.

Q.—In the figures you have given, yon have not taken into consideration depreciation of the plant, interest on the loan, etc.?

A.—No.

Q.—The longer it takes for the scheme to reach completion the higher would be the cost, because of the interest that would accrue?

A.—Naturally.

Q,—What may appear to be a profit on paper may eventually turn out to be a huge loss if time is allowed to elapse?

A.—Yes.

Q.—How do you arrive at the actual cost of a square yard of land? You take into consideration the money already spent and to be spent hereafter : and add interest charges, depreciation, etc. Is it not so?

A.—Yes.

Q.—Because Sir Alexander Gibbs has not done it, that is why I am asking you. You have not checked any of the quantity figures? The figures are simply furnished by the Development Department ; you have not verified any of the figures?

A.—We have checked the quantities.

Q.—Any verification of the figures?

A.—There are two sets of figures, one for quantities and the other for prices.

Q.—In preparing your estimates have you depended on the figures that were submitted by the engineers of the Development Department or worked them out independently?

A.—We checked the quantity of filling required ; and as regards the prices, we took the ordinary accounts, *i.e.*, cash outlay on the work done so far.

Sir M. Visvesvaraya.—You had sections and levels taken?

A.—We checked to a certain extent ; we have got all the sections checked.

Mr. Billimoria.—Supposing it is decided to complete the whole of this area, how many years do you think it will take to do it?

A.—I cannot say, Mr. Billimoria.

Q.—In spite of your very vast experience spreading over 20 years?

A.—Vast experience does not enable one to say off-hand ; you have to look into the feasibility of it, the lay out of the thing, how you arrange it, etc. It requires some thinking. I could give you an estimate, but I cannot do off-hand.

Q.—Roughly, how many years, 20 or 30 years.

A.—I cannot say ; a great many things may happen. Anything between 10 and 50 years.

Q.—You have some experience of quarrying stones. What would it cost for 100 cft. after allowing for plant, everything? I suppose you pay royalties as well in some cases?

A.—No ; we have bought the land.

Q.—As regards the stones that the Development Department is using for the reclaimed area, what is your experience?

A.—There are several kinds of stones. One is a large stone which they have been using for the stone rubble bumd, and the other stone is broken.

Sir M. Visvesvaraya.—Can you give the different rates, within the last ten years?

A.—I do not know whether the Development Department requires any kankar.

Q.—Can you give us an estimate what it works out for 100 cft.?

A.—I shall give you the price.

Mr. Billimoria.—I understand that the Port Trust has got several reports made to them as regards the borings taken off and on ; do you get them even now?

A.—No ; I am not doing any boring now ; recently we were doing some in the harbour.

Q.—Can you give us some report, if any, with regard to these borings within the last five years?

A.—Yes.

Sir M. Visvesvaraya.—Have you any experience of what they call wash borings?

A.—Oh yes. We do a considerable number of wash borings for preliminary work.

Q.—How is that done?

A.—It is done by means of a pump.

Sir Frederick Hopkinson.—Wash borings do not enter the clay?

A.—I do not think it can go through the hard clay ; it probably goes through the soft clay.

Q.—An ordinary pump working for about 30 or 40 feet head would not affect any clay?

A.—That gives you about 20 lbs. pressure if it goes through a tube.

Q.—Through a special pump?

A.—Yes.

Q.—Not through an ordinary pump?

A.—Not a hand pump.

Q.—It is an unusual pressure to get a 300 feet head.
A.—It is not unusual for a steam pump.

Q.—The ordinary pump we have on the works could not do more than 50 ft. or a very little more?
A.—No.

(Mr. Neilson, Chairman of Bombay Port Trust, continued his evidence at 5 p.m. on the 9th August 1926.)

Sir M. Visvesvaraya.—When the whole area is reclaimed there will be 1,145 acres of land. From your experience of Bombay, how would you utilise that land? It is nearly two square miles?
A.—It depends on where it would be in Bombay. You mean on the reclamation? I certainly would make some recreation ground, and the rest business and residential premises.

Q.—Can you not give a rough idea of what you would do. How much will be set apart for recreation purposes?
A.—I should set aside a good lump. Bombay is badly off for open spaces.

Q.—How much, as an Engineer, would you spend on roads, lighting, and drainage for 2 sq. miles of occupied land?
A.—I cannot tell you even roughly.

Q.—Do you think 50 lakhs would be a sufficient figure for 2 sq. miles of land, for roads, lighting and drainage?
A.—I shouldn't say so off-hand. It depends on the plan. If you have got roads 200 feet apart it will cost much. If you have 400 feet it will cost less.

Q.—The reason why I put this question is—they have put down 212 lakhs. Isn't that excessive?
A.—I cannot tell you unless the plan is put before me and I work it out.

Q.—You cannot give me any rough figure?
A.—No. I would not.

Sir Frederick Hopkinson.—Do you know the "Colaba"? If it had been non propelling, there would be a very considerable saving?
A.—Yes.

Q.—It has cost £270,000?
A.—May be.

Q.—What about the advisibility of propelling engines?
A.—They are quite unnecessary.

(The examination of Mr. Neilson finished.)

(Mr. Brims, Deputy Chief Engineer, was called in and examined again at 5-10 a.m. on the 9th August 1926.)

Sir M. Visvesvaraya.—Will you kindly make a note of the information required? Description of each dredger; the cost of working each dredger etc.

Mr. Brims.—That I have already submitted.

Sir M. Visvesvaraya.—Also the percentage of time utilised for actual dredging.

Sir Frederick Hopkinson.—We want at a future date to go into all the details. We want you to be prepared to give all the information as soon as we are ready. You know the kind of information we want. No point is too small for us to go into. I want it done in some sort of intelligible form.

Sir M. Visvesvaraya.—In a statement form?

Mr. Brims.—I have given you a statement which is detailed: wages, stores.....

Sir M. Visvesvaraya.—And the time also during the working season, how many hours the dredger was actually working, how many hours under repairs and how many hours shifting its position. You can give us also the capital cost, the cost of bringing into India and other similar data.

Sir Frederick Hopkinson.—We have got the actual cost?

Mr. Brims.—There is one point. The cost for the working season; is it only for the period we were working leaving out of account non-working season?

Sir Frederick Hopkinson.—We want it as well, but separately, because it is a cost.

Mr. Billimoria.—Have you seen Sir Alexander Gibb's report?
A.—I have seen it to read through, but not to study it.

Q.—You know that Sir Alexander is an Engineer of great repute?
A.—Yes.

Q.—He recommends dry filling?
A.—Yes.

Q.—He says here in page 2, paragraph (c), that the results of the dredging up to the present are most unsatisfactory, and although they may at time show some improvement I am of opinion that even though the restrictions by the Royal Indian Marine and Port Trust authorities were removed they are not ever likely to be economical. Then he goes on to say, the reason is the unsuitability of the dredging plant for dealing with the material as it exists both in the Harbour and in the Back Bay. Have you any comments to make with regard to the unsuitability of the dredging plant?
A.—I do not consider it unsuitable.

Sir Frederick Hopkinson.—At that time, did he know it was 8 annas?
A.—I think not.

Q.—How could you say unsatisfactory from the point of view of economy, he says so, it is not ever likely to be economical? Did he know you were doing for about 8 annas?
A.—I do not think he did, but that is a point I do not know, I am not certain about.

Q.—He was here for very short time?
A.—Yes.

Mr. Billimoria.—As you pump out clay, about 40 per cent. of water comes out of it?
A.—The percentage of water varies considerably.

Q.—How much is the percentage?
A.—There is no fixed percentage: 90 per cent. of water at one time, at another time I may have 50, 60 or 75 per cent. of material.

Sir Frederick Hopkinson.—75 per cent. of material?
A.—For a short period of time and not for any length of time.

Mr. Billimoria—On an average you have about 40 per cent.?
A.—On an average I should think we have got—yes, rather more than 40 per cent.

Q.—At most you retain 60 per cent. of the material pumped out?
A.—Well, I hardly think we will get 60 per cent. taking it for the season.

Q.—How much will it be?
A.—It will be rather less than that.

Q.—If the dredging plant was designed to pump 2,000 cubic yards, about 1,000 will be retained?
A.—If there was 50 per cent. of water and 50 per cent. of material.

Q.—In this report I find that Sir George Buchanan estimated the number of pumping hours to 2,550, the quantity of material dredged 2,000 per pumping hour and actual filling as measured in Back Bay also 2,000. Do you think that that estimate is correct?
A.—Oh yes, the actual filling might be 2,000 cubic yards.

Q.—How do you allow for the water?
A.—If we are pumping 2,000 cubic yards of material you may get 2,000 cubic yards of material retained in the pumping.

Sir Frederick Hopkinson.—The pumping itself is capable of throwing 12,000 cubic yards per hour of water. The question is about the percentage of material in the pumping.

Mr. Billimoria.—You, as an Engineer, must know that when the clay is pumped into the area before it settles down, some water must evaporate. It takes time for the water to evaporate and make the clay harder there on the surface. How long it takes for the entire quantity of water to evaporate from the clay and make it hard enough?
A.—The clay which has been pumped out of the Harbour comes through in two forms: one is in big lumps that settle down immediately when they come out of the pipe. You can walk on it in a few minutes. There is another form in the form of a fine powder in suspension in water.

Q.—How long does it take to settle down?
A.—I am not in a position to say that.

Q.—At such a reclaimed area do you think large quantity of moorum would be required to form a hard land ready for building operations? Small layer of moorum would be sufficient. Has that been your experience?
A.—That has been our experience on this reclamation.

Q.—There is no area ready?
A.—There is an area covered with moorum in part of block No. 8 area.

Q.—It does not sink?

A.—It does not sink, all over the portion of the southern most layer of block 8 which has been covered with moorum.

Sir F. Hopkinson.—What is the speed of the floating material through the pump?

A.—That varies considerably. We have found it to be 10 to 12 feet per second.

Q.—What percentage of dredged material is going through the pipe and put into the reclamation, of silt?

A.—We have been pumping about 20 per cent.

Q.—Have you tested it?

A.—We have not tested any specific material. We have taken what the velocity and percentage of material were at different times. But it is impossible for us to take tests when it is in silt only or in clay only.

Q.—When you were pumping silt only, because that is the uniform material, but the clay is a different matter?

A.—Why?

Q.—You say you have not been able to find out the percentage of silt in pumping. That is one of the elements of a Dredging Master's duties and he should know what percentage he is getting. What did your tests show in the way of percentage of silt?

A.—We have not taken any specific test in silt only or in clay only. We have taken tests at given times.

Q.—With what results?

A.—I do not remember off-hand.

Q.—Can you get that information for me?

A.—Some were taken during the last season.

Q.—Don't you take that every day?

A.—No.

Q.—You said just now something about getting 75 per cent. of material.

A.—Of solid clay. I have seen it.

Q.—It must be in consequence of a block of clay?

A.—Well, it may have been a block. But we have got the solid clay coming through the pipe.

Q.—But that is only as a consequence of some temporary stoppage. Did you get 70 per cent.?

A.—I think I said at the same time "for a short period".

Q.—It is not as a consequence of pumping speed. What percentage of solid clay did you expect the pump to do?

A.—That again depends on the nature of the material.

Q.—Give me the different kinds of materials?

A.—I am afraid I cannot give the difference between the various materials.

Q.—That means you can't tell me the definition?

A.—I can give you some general idea.

Q.—You cannot tell me what percentage?

A.—We might get 15, 20 or 30 per cent.

Q.—I want to know what you did, and how you found out that you were getting 15, 20 or 30 per cent.?

A.—We have had observations taken with a pipe held at the end of the pipes outside.

Q.—You cannot tell me what percentage of clay you dredged?

A.—It is impossible.

Q.—You ought to tell what percentage of silt you got, by way of experiments if any held?

A.—Experiments were held but I do not know the results. They were taken during the last season during the season 1925-26 and the particulars were taken away by Sir George Buchanan's representative, who held the experiments.

Q.—That was how long ago, two years ago?

A.—No, that was last season.

Q.—Who was the representative who took these tests?

A.—Mr. Settle.

Q.—Have you got a copy of the results?

A.—No. They were taken away by him.

Q.—If I were in charge of this work, I would see what the dredger began at 9 o'clock say, on Tuesday morning and say to the Dredging Master or to you, "What percentage are you getting this morning? You got 10 per cent. yesterday, are you going to do better to-day?" You say the gentleman took observations eight months ago, and that you are noting them to judge what the position is?

A.—I have seen the dredger pumping daily.

Q.—You cannot tell the percentage you had out of tests. May I tell a little story? During the war I was looking after a department of Government, and I had occasion

to say that a certain factory was not doing well. The man in charge of the factory took me and showed me round the work, and he thought it was working splendidly. Unfortunately, I got the actual output and found only 40 per cent. efficiency. When I looked round the factory, it looked as if it was doing splendidly, but the actual output was only 40 per cent. Therefore you ought to know every day what the percentage is?

A.—I knew very well the percentage of material was not satisfactory. We were not getting the percentage which the dredger was built for, that is, 2,000 cubic yards per hour.

Q.—You should know well that silt does not require cutting?

A.—I do not mean that you could get more silt by cutting.

Q.—You were talking about 20, 30 or 70 per cent.?

A.—It is spread over a length of period.

Q.—It is only 17 per cent.?

A.—We didn't get the same amount of material. I cannot express any opinion on the silt. I have not taken any tests.

Chairman.—Who has been the actual responsible Engineer for the works since January?

A.—Responsible for, what works?

Q.—"The actual responsible Engineer for the works." I am using the phrase Sir George Buchanan used. Sir George Buchanan's association with this Scheme was up to the end of December 1925, was it not?

A.—Somewhere about that date.

Q.—In January, February and March, who was the Engineering expert at the head of all this?

A.—Mr. Elgee. He was the man I had to deal with.

Q.—Were you the expert dredger, the engineering dredger?

A.—Yes.

Q.—What previous experience did you have on reclamation on an open sea front?

A.—I had some experience in South Africa on the Cape Naval Base.

Q.—When did you get that experience, in what year?

A.—March 1902.

Q.—When did it close?

A.—About the end of 1911, November or December.

Q.—Were you continuously on dredging at the Cape for those nine years?

A.—Not dredging only.

Q.—How much of the nine years was occupied in dredging?

A.—It is going back rather long time. I forget the exact year. It might have been five or six years, I was occupied in dredging work.

Q.—What was your exact position on the dredger?

A.—I had not been on the dredger. I was a junior engineer of the works at that time.

Q.—Did you have any practical experience of rotary cutter machine?

A.—Not before coming here.

Q.—Well, that is the delicate part of the whole thing, isn't it, the getting the cutter to work at its maximum speed, taking the best cut which the material will allow?

A.—It is not my duty.

Q.—I am only asking you about your experience. So, you would not be able to tell me with regard to this particular work, at all events, at the outset whether you were doing the cutting properly or improperly?

A.—I considered I was.

Q.—Did you know as soon as you came whether the output was all right?

A.—As soon as I saw the dredging, I could see I would be able to tell if the men were getting a fair percentage of material or a poor percentage.

Q.—And to what conclusion did you come?

A.—That they were getting a poor percentage.

Q.—All the while you have been in charge, you were getting a poor percentage?

A.—I have never been satisfied with the percentage.

Q.—Apart from your experience, as mentioned above, have you had any other experience on reclamation on an open sea front?

A.—No.

Q.—Were you nominated by Sir George Buchanan?

A.—Yes.

Q.—I don't know whether we have got any letter, say, a letter written by Sir George Buchanan to the Development Directorate in relation to your employment?

A.—There was.

Sir F. Hopkinson.—How old are you?
A.—46 years.

Q.—So then in 1902 you were only 22 when you were on the dredger?
A.—Yes. All the marine work was under my supervision.

Chairman.—On the 23rd July 1925, Messrs. Meik and Buchanan say: "We have had long conversations with Mr. Brims and have formed an opinion that the main cause of low output is the lack of incentive to the men in the form of bonus on output and also there would appear to be too much time spent on obtaining hard material at the expense of output which we consider of greater importance". Did you try the bonus system?
A.—The bonus system was tried.

Q.—Did any man ever get to the point of earning the bonus?
A.—There was a very little bonus paid to some men.

Q.—In one of the papers it is stated that no bonus was ever paid?
A.—Bonus was paid for two or three months.

Q.—To about how many men?
A.—To all the officers on the "Sir George Lloyd" and "Colaba".

The Committee assembled at 11 a. m. on the 10th August 1926, all the members being present

6th Witness

Mr. A. C. Girdwood, Deputy Dredging Master

Sir Frederick Hopkinson.—What is your full name, Mr. Girdwood?
A.—Alexander Chapman Girdwood.

Q.—What is your position in connection with dredging?
A.—I am Deputy Dredging Master.

Q.—Who is Mr. Spiers?
A.—He is my immediate superior.

Q.—And in his absence you are in charge?
A.—Yes.

Q.—Have you got an extended experience of dredging?
A.—I had 7 years in West Africa and about 2½ years in Sudan. That is the extent of my experience.

Q.—What was the kind of material that you had to deal with in West Africa?
A.—Mud and clay. This was a bucket dredger.

Q.—Had you any experience of suction dredger?
A.—No.

Q.—And in Sudan; was that a suction dredger?
A.—Yes, 24 inches dredger.

Q.—What sort of material you had to deal with?
A.—Soft clay.

Q.—Anything like that you have here?
A.—A part about the same.

Q.—Was mud of the same sort?
A.—Deep silt was rather similar to this.

Q.—Was there any sand below?
A.—Yes, just about the same.

Q.—What output did you get there in the 24" dredger?
A.—We used to get 9 per cent. solid matter.

Q.—Did you test that daily?
A.—No, the engineer tested it 6 to 8 times in a month.

Q.—That is about every 4th day?
A.—Yes, about that.

Q.—Did they tell you about it?
A.—They did not tell us what were the figures.

Q.—They did not wish to encourage you?
A.—Perhaps, I do not know.

Q.—Was your 10 per cent. an effective percentage of dredged material?
A.—It all depends on the pipe line.

Q.—How long was your pipe line?
A.—About 2,000 feet.

Q.—About 2/5th of what you have here?
A.—Yes.

Q.—What percentage would you expect to get here?
A.—I think 12 or 14 per cent.

Q.—And that would be a very good percentage?
A.—Yes, I think so.

Chairman.—By percentage you mean proportion solid matter carried out by water through the pipe line?
A.—Yes.

Q.—Now in Sudan you were getting 9 to 10 per cent. That means the percentage deposited at the end of the pipe line?
A.—Yes.

Q.—Here you think 12 per cent. of solid material should go through that pipe line and should be deposited at the other end?
A.—Yes.

Sir F. Hopkinson.—Do you expect 2,000 cubic yards per hour from "Sir George Lloyd"?
A.—Perhaps more.

Q.—How much is it?
A.—I cannot tell off-hand.

Q.—Is it much more or less? Say, 15,000 feet?
A.—About that.

Q.—But you should be getting 2,000 yards an hour. Can you tell me why you did not get that?
A.—I am afraid, I cannot.

Q.—Is that an insoluble problem?
A.—For a man of my experience. A very clever engineer will be able to solve that problem.

Q.—You do not know why you have not got that?
A.—No. I do not know any reason.

Q.—All you know is that you did not get it?
A.—Yes.

Q.—As regards your dredging in Egypt, was it dredging from the sea?
A.—No. That was dredging from Nile only.

Q.—Can you tell me what your percentage of delays was?—About 40 per cent.

Q.—You used to have about 40 per cent. delays?
A.—Yes.

Q.—Is that not unusual?
A.—No.

Q.—Having got 36 per cent. delays here in open sea, would you not think 40 per cent. unreasonable time for delays?
A.—I do not think so.

Q.—You think it should be more in ordinary circumstances in an open sea?
A.—It should be.

Q.—Actually it is only 36 per cent. Therefore the percentage, in your opinion, is low here?
A.—Yes.

Q.—Is the cutter working efficiently?
A.—Yes.

Q.—Has it any real trouble in cutting the clay?
A.—Sometimes. It depends on the soil you are cutting.

Q.—Is the clay too hard for the cutter?
A.—Yes, at the bottom. The bottom strata is very hard.

Q.—At what depth?
A.—The bottom varies.

Q.—What thickness you think is the clay too hard for the dredger?
A.—The last cut we got was 18 inches. We could not get below that.

Q.—The last depth you reached was 37 feet?
A.—Yes; that was "Sir George Lloyd".

Q.—18 inches is about 5 per cent. of 37 feet and only to this extent, that is 5 per cent., it is difficult for the dredger to dredge material?
A.—Just for that class of cut.

Q.—Was the 24 inches dredger in Egypt much quicker than this?
A.—Yes. It was running at 250 revolutions while this is doing 145.

Q.—Generally speaking are you satisfied how the dredger is dredging?
A.—Yes.

Q.—You think it is quite good?
A.—It is one of the best machines I have come across.

Q.—What vaccum are you getting in your suction pipe?
A.—About 10, 12 or 14 inches.

Q.—Is that very high?
A.—I do not think so.

Q.—You actually get 14" at a given load?
A.—Yes.

Q.—What is your discharge pressure?
A.—It is about 35 lbs. per square inch.

Q.—I want you to tell us exactly how you work the dredger? What length of cut you take?
A.—About 200 to 300 feet.

Q.—Do you work side ways or end ways?
A.—We have got to go ahead also.

Q.—What depth of cut you take in the silt?
A.—It depends on the cutter.

Q.—In a fresh cut you get 5 feet below the bottom of the silt?
A.—Yes. But sometimes it is less.

Q.—In the first case you take a 5 feet depth cut in the silt?
A.—It is about 12 feet.

Q.—Having done the silt, what depth of cut you take in the clay?
A.—About 6 feet.

Q.—Then you go ahead 5 feet?
A.—Yes.

The witness explained the process of working the dredger.

Q.—Can you make any suggestions to improve the output?
A.—I cannot.

Q.—Is it positive?
A.—Yes.

Q.—How many hours were you working in the last season? I mean the men.
A.—They work 8¼ hours.

Q.—Did you get 16½ hours dredging including delays?
A.—Yes, lately.

Q.—Are you in charge of the dredger when she is working?
A.—No, Mr. Spiers.

Q.—Does he superintend the whole thing constantly?
A.—No. He has to attend to the other dredger also in which case I follow him as in charge of the dredger.

Q.—You go over one shift?
A.—I take no actual part until the man is ill. I only supervise.

Q.—How many Dredging Masters have you?
A.—I have got two assistant Dredging Masters.

Q.—They are on watches?
A.—Yes, they do 8½ hours watch.

Q.—So that you are actually in real control of the whole dredging?
A.—Yes.

Q.—If anything goes wrong, that is your responsibility?
A.—Yes.

Sir M. Visvesvaraya.—How many months in the year is the dredger at work?
A.—About 6½ months. From start of October till about end of May.

Q.—What is the normal working time during a day of 24 hours?
A.—16½ hours a day.

Q.—On an average how many of these are effective?
A.—16 hours.

Q.—In the 6½ months that you are working during a year, what portion of this time is effective? You do not work 16 hours and you cannot get the same output regularly every day. How many hours do repairs, etc., take during a working season?
A.—No. We should have none.

Q.—Is the dredger working all the 16 hours during the six months?
A.—With the exception of Sundays and other holidays and Saturday afternoons when the dredger closes down.

Q.—What is the percentage of working time during the working season?
A.—You will get those figures in the office. I have not got them.

Q.—Do you look to these figures or did you ever call for them?
A.—No. I only send a copy of the daily report.

Q.—Have you got a copy of the daily report?
A.—No.

Q.—What does the daily report show?
A.—That gives the actual hours of dredging and the reasons for any stoppages, etc.

Q.—Does that give daily expenditure?
A.—No.

Q.—Can you work longer hours: I mean more than 16½ hours?
A.—Yes.

Q.—Will you get more work?
A.—Yes.

Q.—Is it possible to work 3 shifts in order to increase the output?
A.—It is quite possible.

Q.—You will do it if you are ordered?
A.—Yes.

Q.—How much, you think, the output will be increased. Supposing if you are doing 100 cubic yards now how much it will be increased to ?

A.—I do not like to answer that.

Q.—What percentage of increase on an average would you get ?

A.—I would not answer that. I am not sufficiently versed in that.

Q.—You agree that 3 shifts are possible ?

A.—Yes.

Q.—And you will get increased output by working 3 shifts ?

A.—Naturally.

Sir F. Hopkinson.—Do you think it is desirable ?

A.—No.

Chairman.—Why ?

A.—Because you will not get the same advantage as you get by working during the day.

Q.—You would have to be put on duty for 24 hours ?

A.—I do not mind about myself.

Q.—Particularly in a dredger like this when it is not working 5½ months on account of bad weather, it might be necessary to work 3 shifts during the working season ?

A.—It is advisable to try that.

Q.—Besides a daily report, what other returns do you submit in a week or a month to the Head Office ?

A.—That is all I submit. The dredger Master takes charge of all the papers.

Sir M. Visvesvaraya.—Did you go into the calculations about cost ? Do you think that the dredger can be made more effective by increasing the engine power or by substituting more powerful cutters ?

A.—No.

Q.—Or by altering the design of cutter ?

A.—No.

Mr. Billimoria.—Who recommended you for this job ?

A.—No one. I saw an advertisement and I went before the selection committee.

Q.—And you were one of the candidates selected ?

A.—Yes.

Q.—In reply to Sir Frederick Hopkinson's question you said that you had some previous experience of the dredgers. Have you had any previous experience of reclamation work on an open sea ?

A.—No.

Q.—In reply to another question you said that "Sir George Lloyd" is one of the best machines you have ever seen. Do you think it is suitable for the material in the Back Bay ?

A.—The material was suitable harbour and delivering into Back Bay.

Q.—What do you attribute the failure to ?

A.—I think it is due to the length of the pipe line.

Q.—Does the length of the pipe line actually interfere with the actual quantity that is to be pumped ? Does it interfere with the output of the material ?

A.—Yes.

Q.—In what proportion ?

A.—I cannot say that.

Q.—Do you know what is the extra length of pipe line than it was originally estimated ?

A.—I do not know.

Q.—Your conclusions are not based on actual facts but on surmise ?

A.—Yes.

Q.—No data to go upon ?

A.—No.

Q.—In 1923-24 the number was 842.....

A.—Excuse me I was not here. I have only been during one dredging season, that is the last dredging season. I arrived in September 1925.

Q.—What are the results since you took over charge ? Have they improved ?

A.—I should think so.

Q.—Have you got the figures ?

A.—No, they are in the office.

Q.—You concern yourself about the work only ?

A.—Yes. Even we may concern ourselves with figures, we do not get them.

Q.—Have you not asked for them ? Did you make any enquiries about it ?

A.—I cannot say.

Q.—Your job is to dredge as much material as you can from the sea bed and transport it through the pipe line. You are not concerned with anything else except that one duty and the general supervision?

A.—Yes.

Chairman.—You mentioned Mr. Spiers name. Where is he?

A.—He is in England on leave at the moment.

Q.—Do you know when he is coming back?

A.—He is due back on the 26th of October.

Q.—When will he leave?

A.—He will leave Renfrew, Scotland, about 14th October, but it depends whether he goes round by sea or not.

Q.—Do you know his address?

A.—I have not got it here but I can give you.

Sir Frederick Hopkinson.—Have you ever had monetary inducements for increased working?

A.—Yes.

Q.—How long you got bonus?

A.—For about 6 weeks.

Q.—What amount?

A.—I got about Rs. 260 in all for two months.

Q.—It is not much of bonus?

A.—Anyhow it was very acceptable.

(The evidence of Mr. Girdwood was concluded.)

7th Witness.

Mr. G. M. O'Rorke, Resident Engineer, Kandivli Quarries.

Examined by Sir F. Hopkinson.—What is your full name?

A.—George Mackenzie O'Rorke.

Q.—When were you appointed?

A.—I joined on the 4th September 1920.

Q.—So you have been here for the whole period of the work?

A.—Yes.

Q.—What is your particular office?

A.—Senior Deputy Chief Engineer.

Q.—I do not care about the title. What is your job?

A.—Mainly to run the quarry at Kandivli, and I have also got to supervise the works in the Marine Lines and Colaba.

Q.—Are you in sole charge of the quarry?

A.—Yes.

Q.—Have you so been in sole charge since its commencement?

A.—Yes, under the Chief Engineer of course.

Q.—Sole charge at the quarry?

A.—Yes..

Q.—What staff have you there?

A.—I have got a Sub-Engineer, a Mechanical Foreman, one Accountant and two clerks, an Assistant Store-keeper, a Time-keeper, a Doctor and a Jamedar in charge of the camp.

Q.—How often do you come down here to see to the unloading of the material?

A.—Once or twice a week.

Q.—Do you not think that ought to be in the hands of some down here?

A.—It is in the hands of Mr. Thomas. I supervise Mr. Thomas.

Q.—Can you tell me the approximate amount of moorum you have available for filling in your present quarry?

A.—We have got another 4 months' supply at the rate of two trains per day.

Q.—That is 200,000 tons. I thought you told me it was 400,000 when I was at the quarry the other day. What are you going to do when you have exhausted that?

A.—I have put an application to take in more land, which has already been notified. I have put in for about 31 acres. I think we ought to get a year's supply from that.

Q.—Supposing you are called upon to supply five or ten times as much. Is there any place near there where you can get material?

A.—I think there are possibilities of it. That is well worthwhile investigation. We want to have trial borings done. I can only tell by walking over and merely guessing the possibility. My opinion is it is well worth investigation.

Q.—Of course it would be a great advantage to get it near where you are, because you have roads, sidings, houses, offices, etc., there?

A.—Yes. But as we shall probably have to take over a long length of land, possibly 8 miles, it may not be economical to bring all the earth through Kandivli, but to make sidings from the Railway at other points.

Q.—It is not physically impossible?

A.—I do not think so.

Q.—All it would mean would be the cost of another connection of long Railway tracks?

A.—Yes.

Q.—Is the material dug and loaded by piece work?

A.—On contract.

Q.—You get the weight delivered into the trucks weighed over a weigh-bridge?

A.—Yes.

Q.—What is the price?

A.—Re. 0-10-8 a ton including freight.

Q.—What is your price that you pay the Sub-Contractor for putting the material into the truck?

A.—We pay the Sub-Contractor Re. 0-10-8 per ton of murum loaded into the wagons. This rate includes freight at the rate of Rs. 350 per rake of 50 wagons or Rs. 7 per wagon. This freight is deducted from the contractor's bill as actual payment of freight to the Railway is made by the Development Directorate.

Q.—That works out to about 5 annas per ton?

A.—Yes.

Q.—Has he got a good contract?

A.—He has done the work pretty well.

Q.—Do you think he has made a reasonable profit?

A.—I think he has.

Q.—What is your railway freight?

A.—If we send two rakes we send at 275 per rake. If we send 1 rake, we pay 300.

Q.—You consider 5 annas a ton a low price?

A.—I do. It was the most favourable tender received among 70 tenders.

Q.—You pay Rs. 275 per 1,000 tons if you send 2 rakes a day. If on the contrary you send only one you pay Rs. 300 a rake. Suppose you send 10 trains a day. Do you think you get a descending ratio of charges?

A.—We have got quotations from the Railway. It was six rakes a day, and the lowest quotation was Rs. 250.

Q.—So that with six rakes a day you can get a price from the Railway of Rs. 250 a rake?

A.—Yes.

Q.—How does a ton of this material compare with the cubic yard?

A.—Equally in the wagon. A cubic yard in the wagon weighs a ton.

Q.—You have not used any of the excavating machines up there, have you?

A.—No, Sir. We have got 3 Wilson shovels, and one Bucyrus—4 in all.

Q.—None of them has worked there as shovels?

A.—No.

Q.—Were they all new?

A.—The Wilson shovels were new, but the other was second-hand. It cost £ 9,000.

Q.—So that for the purpose of digging those machines have been absolutely useless?

A.—Quite.

Q.—You have however used the Wilson machines as cranes?

A.—Yes.

Q.—That is only I presume, because you had them?

A.—No, Sir, it was the other way. In 1923 I think it was we wanted more heavy cranes in the quarry, and the Chief Engineer called for quotations. And he found he could get these which could be used as cranes for very little more than the price of a crane, and that is why they were bought; they were really required as cranes.

Q.—Was not the primary object of buying them that they should be worked as navvies?

A.—No, Sir. It was that they should work them as cranes.

Q.—Surely there is considerable difference in prices between a navvy and a crane?
A.—No, I think it was £240 or something like that. I am talking from recollection.

Q.—As it is you were filling the trucks by cranes and skips. What would be the difference of price between filling it in skips and filling it in wagons direct?
A.—I have not worked that out, but I think it is possibly half an anna a ton. When our men worked in the quarry they had not to do any lifting at all.

Q.—That is not so to-day.
A.—No.

Q.—Your price to-day is based on lifting it up?
A.—Yes.

Q.—Is the 5 feet on which extra payment is made measured from below the level of the rail or the top of the truck?
A.—Below the level of the rails.

Q.—That puts nearly an anna into the ?
A.—Yes, but the proportion loaded from that depth is small.

Q.—Who made the contract for unloading this material?
A.—The Chief Engineer.

Q.—What is the price you pay for that?
A.—Two annas a cubic yard.

Q.—I was told 2¾ annas the other day?
A.—You asked me what I had calculated. I said 2¾.

Q.—I was told the price being paid was 2¾ annas?
A.—No, that is wrong. It is a mistake.

Q.—Mr. Thomas told me you were actually paying 2¾ annas.
A.—Unless my memory is very bad, it is not so.

Q.—Let me see the actual vouchers on which you pay for the loading material in the quarry?
A.—Yes, Sir.

Q.—Is that two annas for unloading the same behind the wall where you are unloading to-day as on the side where it has been carried 100 feet?
A.—Yes.

Q.—Why did you do that?
A.—That was the way the contract was given.

Q.—But suppose you are tipping ten times as much behind the wall, the price would be very unfair as against Government?

A.—It would. But the quantity of earth which can be tipped direct from the wall is only a small portion of the whole contract.

Q.—Should you not have a contract that is elastic for different works? Would not the proper price for tipping that material from behind the wall where they are tipping it to-day be about half an anna?
A.—Yes, it would be so if it was a contract by itself.

Q.—What overhead charges have you at the present time at the quarry to put on to this filling? There is superintendence you have told us.
A.—We have got the Power House to repair the wagons, and maintenance generally.
Q.—Can you tell me why it is done 22 miles away?
A.—We had a better workshop there and more machinery in the quarry to look after.

Q.—Coming to these overhead charges, you had cranes, one or two locomotives and a drilling plant. How many locomotives have you?
A.—We have got three. One is working. It costs Rs. 50 or 60 a day, coal, stores, wages and everything.

Q.—It seems to me a very very high price. What does coal cost here?
A.—Rs. 18/4 per ton.

Q.—How do you get Rs. 50 or 60 a day?
A.—Coal is about 1½ tons. Then there is the driving crew.

Q.—How many?
A.—I work in two shifts. The locomotive works from 5 o'clock in the morning till 10 o'clock in the night. That accounts for the high prices.

Q.—What are your overhead charges?
A.—Repairs to the wagons, pumps for supplying water to the camp and the works generally.
Q.—Within the next day or two can you give us a statement of what your daily overhead charges are over the actual cost of filling? We have got it that you pay five annas a ton for filling.
A.—I have got a statement here that will perhaps answer you.

(Mr. O'Rorke puts in a statement showing the actual cost of the filling of the earth at the quarry.)

The establishment comes to Rs. 5,135 per month.

Chairman.—That document is complete with that addition?

A.—Yes.

Q.—Can you tell me why you are repairing the dredging plant of the quarry?

A.—We are doing at a less cost than would be charged by the commercial houses in Bombay.

Q.—You have got there extensive and elaborate workshops?

A.—I think very good workshops.

Q.—I did not say "good". Don't you make those concrete blocks for storm water drains?

A.—Yes.

Q.—Did you have a programme given to you as to the number to make in one year yourself?

A.—Yes.

Q.—Can you tell me why the blocks made in 1923 are still unused?

A.—Partly because they did not use the blocks as quickly as anticipated. Also because the works were suddenly shut down about a year ago.

Q.—Even then, that was in 1925. Even then these blocks were made two years before they could possibly be wanted.

A.—If they worked out their programme they could have been used.

Q.—The programme could be varied.

A.—It was not varied.

Q.—You were given a programme which was never altered?

A.—Yes.

Q.—Why should not those blocks be made down here at the site?

A.—We had the stone, the ballast of the quarry ready.

Q.—Did you have the cement there?

A.—No.

Q.—Did you have the water supply there?

A.—We had water. In the dry weather water was always difficult with us.

Q.—Where did the cement come from?

A.—All Indian cement. It was Dwarka cement which is somewhere in the north here. It was taken from Bombay to Kandivli and then brought back. I think it must be. It was sent by the Materials Division. I think they supplied every thing from Bombay.

Sir Frederick Hopkinson.—Have you tried any of the navvies for filling material?

A.—I tried with the Wilson navvy with a driver who had never done it before. I could not get anybody else.

Q.—You would not call it a fair trial?

A.—No, there was no fair trial.

Q.—A navvy requires a man of considerable skill and considerable judgment?

A.—Yes, but I have not got such a man.

Sir M. Visvesvaraya.—In the statement given by you you have given the cost of earth per ton at 15 as. 10 pies. What other charges have to be added to this in order to get the final rate for filling?

A.—All the charges of the Bombay end of the work such as shunting and unloading.

Q.—Do you happen to know the rates?

A.—I think it will be about four annas.

Chairman.—What is four annas for?

A.—For shunting and unloading.

Sir M. Visvesvaraya.—You have got Re. 1 here roughly and you want to add 4 annas. That will be Rs. 1-4?

A.—Yes.

Q.—What other charges have to be added in order to get the final rate in the estimate?

A.—Establishment has got to be put in there, and you will have to allow for settlement.

Q.—Dry filling has cost 1·56 rupees per cubic yard. This figure was given by the Development Director. Do you agree that that rate represents the correct cost now?

A.—No, it is less now.

Q.—By how much roughly?

A.—20 per cent.

Q.—It is Re. 1 for delivery, 4 annas for emptying and filling and 15 per cent. to be added for shrinkage and the rest I suppose would be for overhead charges?

A.—Yes.

Q.—So there will be a saving of about 20 per cent. on the estimate put for last year?

A.—There will be a saving of about 20 per cent.

Q.—So it will cost you 1·25 per cubic yard consolidated at the site?

A.—No, Sir, I said the actual cost per ton in Bombay. The quarry charge plus rate of 4 annas for Marine Line charges. Now you have to add 15 per cent. to that.

Chairman.—If you add 15 per cent. to 1-4 it comes to 1-7.

Sir M. Visvesvaraya.—1-7 is the correct rate now. You have no idea of overhead charges for supervision.

A.—I do not know.

Q.—If instead of having two rakes a day you had ten rakes as Sir Frederick said just now, by how much could you bring down the cost on account of the quantity being large?

A.—I think 25 per cent.

Q.—You can bring down the cost by 6 annas roughly?

A.—Yes.

Q.—What is the advantage of filling from the Back Bay if you can get dry filling at Re. 1-1 per cubic yard? Now dredging costs 1·3 rupees?

A.—1·3 was taken on the results of the dredging experience of last season. This season has given very much better results.

Q.—From the Development Director's statement it is 1·3, and it is the latest figure, per cubic yard?

A.—I do not know about that.

Q.—What is the output at present delivered here per day?

A.—2,000 tons.

Q.—How much for a month?

A.—I think 285 working days in the year.

Q.—It would be per annum 5,70,000. Can you increase the daily supply about 5 or 6 times if necessary, if Government asks for it?

A.—I think there is a possibility of it, but it must be thoroughly investigated.

Chairman.—You mean that the material has to be found?

A.—The material has to be found and then you have to make arrangements with the Railway, a railway running its own passenger traffic and its own goods traffic.

Sir M. Visvesvaraya.—They could take six rakes a day and they may go further than that?

A.—I do not know.

Q.—They have recently doubled the line?

A.—Only as far as Grant Road Station. They have still to run over the old track between Grant Road Station and the works.

Q.—What is the amount you have spent on permanent way and rolling stock, roughly?

A.—I am afraid I cannot give you that figure.

Q.—You have spent about 30 lakhs on both?

A.—I do not think so much as that.

Q.—That is the estimate for the permanent way and the rolling stock together?

A.—I do not know. I have not got the figure.

Q.—How much more rolling stock would you need to deliver six times?

A.—If it can be arranged that each rake shall do one round trip for a day, it would mean about 350 waggons.

Q.—How many waggons have you got?

A.—228.

Q.—How many are sick?

A.—Six at the quarry at present. I do not know what we have got in Bombay.

Q.—You have never calculated what additional rolling stock is required?

A.—The cost of the waggon out here is estimated at Rs. 7,000 each.

Q.—The Railway only lent you the use of their permanent way?

A.—They supply the locomotive, the brake vans and the guards. We do not use our own locomotives.

Q.—Supposing more earth is required, where would you look out for additional soil or material?

A.—I have tried to find it out at places near Kandivli?

Q.—You do not think there is any other place nearer the works on the Bombay side?

A.—Not to my knowledge.

Q.—Could you not get the stock from any of the railway stations on the road?

A.—Nearly all the land alongside the line is too low.

Q.—If you have a bed of clayey soil, you might use it for storing water?

A.—It could be so used if required.

Q.—You are the Superintending Engineer of the works?

A.—Yes, and Mr. Elgee is the Chief Engineer.

Q.—Your position is that of a Superintending Engineer, Public Works Department? and you have two Executive Engineers under you?

A.—I have one Executive Engineer in Bombay.

Q.—You have got two separate sections?

A.—Yes, Kandivli and the works in Bombay.

Q.—Does any Executive Engineer submit his papers to you for orders?

A.—No, they are all submitted to the Chief Engineer.

Q.—Do you take out quantities and rates once a month?

A.—They are done at the quarry certainly.

Q.—You are not concerned either with the dredging or the filling in each block?

A.—I am not concerned with the dredging and have no means of ascertaining the quantity dredged.

Q.—What accounts do you submit monthly?

A.—All the accounts called for by the Public Works Department Code.

Q.—The Executive Engineer's accounts come to you?

A.—No.

Q.—Do you have cost sheets daily?

A.—We have daily allocations which are worked out monthly.

Q.—What other returns do you submit to the Chief Engineer or to the Development Director?

A.—We submit our monthly cost accounts.

Q.—Any other reports or returns?

A.—No.

Q.—What is the measurement system adopted for measuring works now at the quarry? You have nothing to do with the dredged filling or with moorum filling?

A.—With dry filling, yes.

Q.—How are the measurements taken?

A.—These are taken over the weighbridge at Kandivli which are periodically checked and are accepted for all calculations.

Q.—Is there a separate store-keeper? Where do you get your stores?

A.—I have got one assistant store-keeper here at Marine Lines and one at Kandivli.

Q.—Are any of your works placed under objection by the Accounts Department, because the estimates have been exceeded?

A.—Yes, unless we have got previous sanction for an excess. But we have none at present.

Q.—When do you check the actual output of moorum. At what intervals do you check the actual quantities?

A.—We do not check. As I said, we work entirely on the weighbridge.

Q.—You do not know what material is deposited. That you leave to the end of the year?

A.—Yes.

Mr. Billimoria.—Under whose orders do you work?

A.—The Chief Engineer.

Q.—Your designation is Superintending Engineer?

A.—No. Deputy Chief Engineer.

Q.—Your duties are those of the Superintending Engineer. You have under you a Sub-Engineer?

A.—I have got one Executive Engineer under me in Bombay. For the quarry I have a Sub-Engineer.

Q.—What is your salary?

A.—Rs. 2,200 a month.

Q.—And the Executive Engineer's?

A.—I think about 1,500, I am not quite sure of that.

Q.—Do you really want a Sub-Engineer and mechanical foremen? Is there work for them both?

A.—Yes.

Q.—Are they kept fully busy the whole day?

A.—Yes.

Q.—You have said that you have four months supply at the quarry now for moorum and you intend acquiring adjoining lands? Do you know what it will cost you to acquire?

Chairman.—Do you intend to acquire the adjoining land?

A.—I have put up a proposal before Government for acquisition of land immediately adjoining the Kandivli quarry.

Mr. Billimoria.—Do you know what it is going to cost you for acquiring that land?

A.—No.

Q.—What area are you going to acquire.

A.—About 30 acres.

Q.—How long do you think it will serve your purpose for dry filling?

A.—At present rate I think for about one year.

Q.—How deep will you have to dig?

A.—Nine or ten feet.

Sir Frederick Hopkinson.—On that point can you give me an estimate of what amount the purchase of land will put on the cost of a cubic yard?

A.—I do not know the value of the land. I know the railway had to pay 4 annas per brass a little more than an anna per ton as royalty.

Q.—Do you think we should not get cheaper than an anna per cubic yard? It is likely to cost more there?

A.—I do not think it is likely to cost less. We may have to dig over a very large area to get the same amount.

Q.—One more question. Are you prepared to stand by that statement which you put in this morning?

A.—Yes.

Mr. Billimoria.—You have got some special concession from the Railway company to carry your stuff from the quarry to the Marine Lines?

A.—I do not know about concession. We have now Rs. 300 for one rake a day, Rs. 275 for two rakes a day and I think Rs. 250 for six rakes for a day.

Q.—Would that charge be the same thing for an ordinary contractor?

A.—Our present rates work out lower than ordinary freight rates.

Q.—Because of the quantity of the material sent?

A.—It may be.

Q.—This is a special concession which is not ordinarily to be obtained elsewhere for an ordinary contractor?

A.—The contractor will have to make his own arrangements with the railway.

Q.—What is your actual cost for stone extraction per hundred cubic feet?

A.—Rs. 10.

Q.—Have you actually worked it out? Is it Rs. 13?

A.—No.

Q.—Do you think it extravagant or moderate?

A.—Moderate.

Q.—The stuff can be had very easily. Do you think Rs. 10 is moderate?

A.—I think it is a reasonable cost.

Sir Frederick Hopkinson.—Does that cover everything?

A.—Yes, that covers all charges.

Q.—What is the cost of the plant at Kandivli?

A.—The actual purchase price of the plant was 22 lakhs. This is a rough figure which does not include the cost of the waggons.

Q.—Could you tell me what is the actual expenditure at your quarries up to now?

A.—About 43 lakhs.

Q.—In the cost statement that you have given have you taken into account depreciation and interest charges? If you take that into consideration, what would your cost work up to?

A.—I cannot tell that.

Q.—It will be very much more than Rs. 10?

A.—I cannot say without working it out.

Q.—If you had given the work on contract to an ordinary contractor, it would be much below Rs. 10?

A.—I do not think so.

Q.—What is the Salsette railway doing?

A.—I have nothing to do with them. Our plant consists of light railways, sentinel wagons, elevators, etc.

Q—Is that plant necessary?

A.—We are not using them at all now.

Q.—It was all ordered out?
A.—Yes.
Q.—What for?
A.—They have been used.
Q.—What does it cost, about 22 lakhs all told?
A.—Yes.
Q.—You mean the 43 lakhs covers everything?
A.—Yes.
Q.—You have not taken into account depreciation?
A.—No.
Q.—What is the correct basis of working out whether a scheme is going to be profitable or otherwise, if you do not take into account depreciation and interest?
A.—The cost of the plant is shown in the project estimate. Running costs are shown separately.
Q.—What do you expect to realise out of the 43 lakhs spent on the quarries if the quarries are exhausted?
A.—I have not estimated yet. Approximately 5 lakhs. But it is only a guess.
Chairman.—Now about the acquisition of land, at the present moment you have a certain area of land at Kandivli which as regards moorum is more or less worked out?
A.—Yes.
Q.—If you are going to transfer more moorum to the reclamation site you will have to find some more land?
A.—Yes.
Q.—And it will have to be land that will give you the necessary moorum and within reasonable working distance of a railway?
A.—Yes.
Q.—The first step would be to have a certain sum of money to acquire that land out and out or to acquire the right to take away moorum on a royalty basis?
A.—Yes.
Q.—That would be the first expense?
A.—No, Sir, I think the first expense would be the prospecting of the earth to be found.
Q.—Assuming that you have made careful borings and are satisfied that the stuff is there, that is the first essential, is it not?
A.—Yes.
Q.—In the same way if you are going to dredge the sea bay the first essential is to satisfy yourself that you have got the material fit for dredging and in sufficient quantity?
A.—Yes.
Q.—And equally essential is to ascertain whether you can get dry filling?
A.—Yes.
Q.—The problem is the same both on sea and land?
A.—Yes.
Q.—Now if you are going to increase your rolling stock to make ten journeys a day that would require 350 extra wagons?
A.—Yes.
Q.—And that alone would amount to 24½ lakhs at Rs. 7,000 each?
A.—Yes.
Q.—Rs. 24½ lakhs, or £170,000. It is rather a big undertaking, is it not?
A.—A lot of money.
Q.—At the end of the time what would the £170,000 worth of wagons be worth?
A.—One-third to half of the original cost.
Q.—Where are you going to sell them?
A.—The railways may find them useful; very good wagons they are.
Q.—Would you have a reasonable prospect of selling them in India at a third of their original cost?
A.—I should think so.
Q.—You think you can get back the 8 lakhs?
A.—Yes.
Q.—At all events it is a very big undertaking?
A.—Very.
Q.—To begin to prospect for a new site for moorum excavation and to get all the necessary plant and to bring it down rapidly to the spot?
A.—Yes.
Q.—Now, as regards the dredger "Kalu", she was bought as we know for £75,000 and taken over in May 1922. There had been complaints from Sir George Buchanan

saying that he had been kept in the dark about a variety of matters since he had left Bombay?

A.—Yes.

Q.—You wrote to him on the 30th June 1922 saying "I think the reason for the lack of information which should have been sent you regarding the work here since February last may be entirely put down to Mr. Lewis's indisposition since that date"?

A.—Yes.

Q.—Then you write "As I have already informed Sir George Buchanan I took over on the 20th May and shall see that you are now kept fully informed of the progress of the work"?

A.—Yes.

Q.—Now, Mr. O'Rorke, all the time since you took over did you keep Sir George Buchanan or his firm well informed of the progress of the work?

A.—We sent fortnightly reports through the Director.

Q.—Did he make a complaint to you or the Director that during the period you were in charge any information was withheld?

A.—Not to my knowledge.

Q.—I notice that one of the things you wanted done was Government's sanction for a costing assistant. At the end of your letter of 14th July 1922 to Sir George Buchanan you say "Government have refused to sanction the appointment of the cost assistant as asked for in Lewis's note on costs, but this I think can be got over." Did you get over it?

A.—Yes.

Q.—That is good. Now going back to "Kalu", did you estimate, on the 25th of August 1922, that the "Kalu" would require overhauling to the extent of 4 lakhs?

A.—I do not remember it.

Q.—Here is your letter of 25th August 1922 to Messrs. Meik & Buchanan: "I have also allowed Rs. 4 lakhs for the overhaul of the 'Kalu'. We had her surveyed by Mr. McMurray of the Port Trust and he estimates this sum will be required to put her in proper working order. I send you a copy of his report herewith." Now does the passage which I have read recall to your recollection the acting taken upon this. You allowed 4 lakhs for overhauling?

A.—I think we must have.

Q.—And was that figure subsequently reduced by a letter of the 20th of February 1923 to Rs. 3,65,000?

A.—I do not know.

Q.—That appears to be the fact from the letter of Mr. Lewis on the 20th February 1923 in which he speaks of repairs necessary for "Kalu" and estimates them to cost Rs. 3,65,000. Now you tell me if you can, had the "Kalu" at that time when you wrote your letter done any work at all?

A.—No; she had done no work for us since her purchase.

Q.—The Development Department are debited with £75,000 for her purchase, and before she does any work at all, Rs. 3,65,000 have to be spent to put her into working order?

A.—That is it.

Q.—Can you as a businessman imagine how she could be given any certificate of fitness which would persuade the authorities to buy her?

A.—I take it, it is much the same as buying a second-hand motor car or other machine. You may buy the car from a garage where it has been thoroughly overhauled, or you may buy it from its owner knowing that it requires overhaul.

Q.—We must look into the facts in each case. But if it was reported as fit and ready for work and £75,000 was paid for her, somebody must have made a mistake?

A.—Yes.

Q.—We must ascertain the particulars under which the Development Directorate bought her for £75,000. We must see the correspondence relating to it and if there is anybody in Bombay who acted as a principal in that transaction he ought to come and give evidence?

Mr. Billimoria.—Mr. Neilson mentioned that both "Kalu" and "Jinga" were disposed of by the Port Trust for Rs. 8 lakhs. Was it not for the Development Department?

Chairman.—As I understand the position, Mr. Neilson said that these two dredgers were sold out and out for 8½ lakhs to the Imperial Government and thereafter they had no further concern with them. The next thing we know is the Government of Bombay agreed to pay £75,000 for the "Kalu". What we want to know is—we know that Sir George Buchanan advised the purchase—what we want to know is whom did the Government of Bombay employ to ascertain that for £75,000 they were getting good value?

Mr. Billimoria.—What was the interval between the Port Trust selling it to the Government of India and resale by the Government of India to the Development Department? Did it undergo exhaustive repairs before it was handed over?

A.—I think they were going for about six years. I know that "Kalu" was in Basra in 1916 when I went up there. I think it must have been working for six years previously. But she was not worked at all in the meantime.

Q.—If she has worked for six years, there would be depreciation in value?

A.—The costs had gone up enormously in six years. The costs of 1914 and 1920 are entirely different.

Chairman.—We must find out somebody in India who can tell us anything about this transaction and specially whether any certificate was given as to her condition at the time that she was sold for £75,000?

Coming to another matter, Sir Frederick asked you about cement blocks which were designed to carry the storm water drain. Is it not a fact that the use of these was either abandoned or greatly curtailed, because it was found that the bed of the sea was not suitable for them?

A.—No; I had no trouble about it here.

Q.—We were definitely told that, that they were unsuitable for the bed of the sea when they came on rock?

A.—Yes; I apologise; it is so; they found that to be so in certain sections.

Q.—So that when they had carefully explored the bed of the sea or when they were actually doing the work they found that these blocks were in parts of the work unsuitable for the bed?

A.—They were unsuitable for the sea in certain places.

Q.—About how many blocks do you estimate are lying at Kandivlee?

A.—1,400.

Q.—How much are they worth each?

A.—Rs. 182.

Q.—Are they ever going to be used?

A.—Yes; when the reclamation is completed.

Q.—So that there are at present £21,000 worth of blocks lying at Kandivlee? And as Sir Frederick has pointed out, some of them have been there since 1923? (There is the date stamp on each one of them.)

A.—Yes.

Q.—Now as regards the 20-ton crane which we saw on the sea wall, was that ever in fact employed to lift 20 tons?

A.—Not to my knowledge.

Q.—The crane was ordered because it was believed that she would swing out 20-ton blocks pell mell into the sea?

A.—Yes

Q.—In point of fact 8 tons is the biggest load that she really ever takes?

A.—Yes.

Q.—And is that a very unusual load?

A.—It is the maximum.

Q.—Usually the utmost is 5 tons?

A.—About that.

Q.—Therefore to that extent the money has been thrown away?

A.—Yes.

Q.—Now, with regard to the three navvies that we saw, they cost £3,000 each, don't they?

A.—I have not the figures.

Q.—I think you may take that as correct. And the big one cost £9,000. Now, the object of the navvy is to shovel up?

A.—Yes.

Q.—If you can get a sufficiently big face and get an expert man to drive the navvy you get extremely good results? It was no doubt with the object of getting good results that the £18,000 was spent?

A.—What was first required was crane. . . .

Q.—I shall come to that later. I think there is a great deal to be said for the way in which you are putting it. At all events, one of the objects for which they were bought was for their ordinary use as navvies. On the 17th March 1922 Mr. Lewis wrote a letter to Messrs. Meik & Buchanan enclosing a very long list of articles that were required. Would you look at that and tell me if you ever saw a copy of that letter, or had any consultation with Mr. Lewis about it?

A.—Mr. Lewis spoke to me about four wheeled locomotives and about the navvies. But not, to my recollection, about the rest of the gear.

Q.—You will find it is substantially correct in a few minutes?
A.—The other items I do not recollect.

Q.—And those were supplementary machinery required partly for quarry work and partly for the sea-wall?
A.—Yes.

Q.—Do you remember whether you ever saw the letter of the 11th April which Sir George Buchanan wrote in reply?
A.—I do.

Q.—The point of this letter is that the firm of Messrs. Meik & Buchanan said that a great deal of this was unnecessary and they were advising the Development Directorate to cut down their demands?
A.—Yes.

Q.—It is only fair to state that, because it has been said that Meik & Buchanan were getting a percentage upon the amount spent, and therefore he would unnecessarily indulge in extravagant expenses and encourage such extravagance. This letter, at all events, of the 11th April 1922 shows that the firm were trying to prevent the Development Directorate spending money on some portion of the suggested requirements and that was followed by the letter of the 12th April 1922, suggesting that the large type of engine which had been specified for in the letter of the 17th March should not be bought and that the train should be run in two parts, the engine to be of the size of the Moss Bay type?
A.—That is right.

Q.—In the letter of the 17th March, No. 20 crane navvy was asked for and it is introduced in this way: "We require more lifting power at the quarry to deal with the heavy protection stone. We shall also require to deal at a later period with large quantities of moorum."

And that machinery in fact was not supplied?
A.—Not supplied.

Q.—There was a telegram on the 3rd May 1922 from the Chief Engineer to Meik & Buchanan which begins "Referring to your letter of the 11th ultimo, discussed with Sir Lawless Hepper" (that is the letter in which Meik & Buchanan were questioning the necessity for all this plant). "Additional lifting power is wanted to handle increased quarry output and 3 Ruston navvies should be supplied."

Chairman.—On the 3rd May, the Chief Engineer writing says, "Sir Lawless Hepper agrees with me that it is best to get the cranes at present. The cranage at the Quarry was originally allowed on the basis of 1,000 tons in a day. I have since re-allocated two 7-ton cranes, one each to Colaba and Marine Lines, and something more has to be got for the Quarry. We have to handle large blocks as these have to be stored as they are obtained in the course of quarrying operations, and in order to do this we must have adequate crane power. These three navvies will also enable us to get out the moorum which will ultimately be required and it seems to me that as they will work as 20-ton cranes at a radius of 23'-6", they would be of more use than ordinary plain cranes. In the telegram I am asking you to proceed with the purchase of all the three cranes." So that as a result of instructions of the Development Directorate three 20-ton navvies were purhased?
A.—Yes.

Q.—Have they lifted any stone?
A.—Occasionally they have.

Q.—You said just now 7 tons was the maximum.
A.—I forgot. It may have gone up to 8 or 9.

Sir Frederick Hopkinson.—That is exceptional?
A.—Yes, exceptional.

Chairman.—Have they ever done anything more than a 7-ton crane could do?
A.—No.

Q.—You might want three ordinary 10-ton cranes there?
A.—Yes.

Q.—You had work for three?
A.—Yes.

Q.—In fact, you have also got there the navvy costing £9,000. What power has it?
A.—I forget at the moment.

Q.—Has it ever lifted anything?
A.—No.
Q.—It represents £9,000 and is lying idle?
A.—Yes.

Q.—Has it done any work as a navvy?
A.—No.

Q.—The only ones that have done work are the three Wilson navvies?
A.—Yes.

Q.—As regards the 10-ton cranes, would three 10-ton cranes have cost considerably less than three 20-ton navvies ?

A.—They would cost less, but I cannot possibly say how much.

Q.— You said an attempt was made to work upon the face of the murum by means of steam shovels ?

A.—Yes, it was not a fair attempt.

Q.—One of the reasons was that you had not got a sufficiently good face ?

A.—We had a good face for a very short area.

Q.—You have not been able to work the three Wilson Steam Shovels at Kandivlee ?

A.—No.

Mr. Billimoria.—A crane which cost you about £9,000 is lying idle and getting rusty ?

A.—We take care of it. We keep it as well as we can. We clean it and keep it oiled.

Q.—You do not expect to use it ?

A.—I do not see any prospect.

Q.—Is there any possibility of disposing of it ?

A.—I don't think anybody would buy it.

Q.—So, this money is gone ?

A.—We might get something. I do not know what they might get ; I have no idea. I am really not in a position to give any idea.

Sir M. Visvesvaraya.—You acted as Chief Engineer for some time ?

A.—Yes.

Q.—Supposing you accelerated the moorum filling to about six times the present output, that will bring about 12,000 cubic yards per day ?

A.—Yes.

Q.—And taking about 300 days in the year, it will be nearly six million cubic yards ?

A.—Yes.

Q.—You know the rate for dredging, and that for moorum filling. . . .?

A.—I don't know this year's rate for dredging.

Q.—Can you do about 1½ million cubic yards per annum by dredging and 6 million cubic yards by moorum filling ?

A.—It might be possible to do so.

Q.—You have had experience as Chief Engineer. (This is a broader question.)

A.— Six million cubic yards by dry filling. It is a possibility, that is all I can say.

Q.—Six million cubic yards of dry filling and a million and a half of cubic yards by dredging ?

A.—Six million cubic yards of dry filling will mean a bigger proposition than twelve trains a day. It will take about twenty trains a day, with 285 working days in the year.

Q.—Couldn't you work on the 300 days basis ?

A.—We do not work on Sundays, then there are holidays and rains knock out some days.

Q.—Supposing you made a special effort ?

Sir Frederick Hopkinson.—Do you think it possible to work 240 days? You have done for 240 days in the year ?

A.—On other works, in Burma I have worked 285 days.

Chairman.—What in fact have you averaged here ?

A.—I should think it is about 285.

Q.—Take 285 as your limit.

Sir M. Visvesvaraya.—That is, about half a million cubic yards per annum you are doing now ?

A.—Yes.

Q.—Supposing you are asked to do 6 million cubic yards ?

A.—It means 12 times as much.

Q.—Is it an impossible proposition ?

A.—It is very very big. We have to make a great deal of investigation.

Q.—Assuming that it is possible, you will have 7½ million cubic yards per annum.

Chairman.—I do not think the witness is prepared to assume it is possible.

Mr. O'Rorke.—6 million is very big.

Sir M. Visvesvaraya.—Supposing you bring up material also in lorries ?

A.—Only very small quantities could be so obtained.

Q.—Both combined, you would not be able to collect 6 million cubic yards ?

A.—No, I don't think so. I think that it is too high.

Q.—Then what is the maximum you could provide daily or yearly ?

A.—We might do 3 million per annum.

Chairman.—Have you ever succeeded in finding a site just within a reasonable distance of a railway having the same gauge as your present truck? That is essential?

A.—Quite essential.

Sir M. Visvesvaraya.—If you could provide 6 millions for moorum filling and a million and a half by dredging, it means 7½ million cubic yards per annum total, that is, in three years you will be able to complete the project?

A.—Yes.

Q.—Then 6 million cubic yards at Rs. 1¼ would cost about Rs. 75 lakhs?

A.—Yes, about half a million pounds.

Q.—Rs. 75 lakhs will be the value of work done in one year and in three years about 215 lakhs. About 240 lakhs will be required to complete the whole work?

A.—Might be.

Chairman.—You have to add the cost of the acquisition of the land and the cost of the rolling stock.

Sir M. Visvesvaraya.—Supposing you spent about 240 lakhs and reclaimed 40 lakhs of square yards, even at Rs. 20 per square yard of land, it will mean 8 crores of rupees worth of land reclaimed. You have a possible income of 8 crores as against an expenditure of 240 lakhs. Do you think that that proposition would appeal to you as Chief Engineer?

A.—No.

Q.—What are your reasons?

A.—I don't believe you will sell the land.

Q.—It will appreciate Rs. 50 per acre if you sell slowly, but you may assume Rs. 20 to spread the sale over a long period?

A.—I think the main difficulty is selling land. If you are dead certain about it, it will be a nice proposition.

Mr. Billimoria.—Supposing you brought out 3 millions, would it not interfere with the railway traffic?

A.—All I can say in connection with that matter is that it is doubtful whether they could run those rakes. We have never asked the Railways to handle more than six rakes.

Sir Frederick Hopkinson.—Did you have anything to do with the original requisition for the plant?

A.—Yes. I was in Messrs. Meik and Buchanan's office for about 2½ months.

Q.—In connection with the preparation of the plan?

A.—From the 4th September to the next two months.

Q.—Can you tell me if the wagon was supposed to be 20-ton or 20 cubic yard wagons?

A.—I think 20 tons.

Q.—Not 20 cubic yard?

A.—No, 20 tons of stone.....

Q.—Because I notice that you have increased the size. Otherwise you could not have got 20 tons.

Chairman.—With regard to the suggestion that it might be possible to bring down 6 million cubic yards of moorum a year roughly, do many unknown factors enter into it? Would you prefer to say whether it is possible or not? As regards price, is it impossible to say at what price it would be done?

A.—Yes.

Q.—First of all you have got to find the locality that will give the 6 million cubic yards a year; then you have got to make arrangements to be allowed to excavate them?

A.—Yes.

Q.—You have got to make railway lines connected with the nearest station and the railway has to be of the same gauge as the connection?

A.—Yes.

Q.—You have got at least to spend £300,000 on new rolling stock?

A.—Yes.

Q.—You have got to have additional labour and if you are going to get out that quantity, you will have to have a face on which you can use the steam shovels?

A.—It might be done by coolie labour if you have a big enough area.

Q.—Would there not be almost an army of coolie labour?

A.—Yes.

Q.—Then you have to provide places for the housing of your people?

A.—Yes.

Q.—Altogether is it possible to say whether your 6 million will cost you one rupee or three rupees per cubic yard?

A.—I don't think it goes as high as Rs. 3.

Q.—Before you can go into the matter you have got to find your land and ascertain the price that you can acquire it for ?

Sir Frederick Hopkinson.—When you were in Buchanan's office, did you have a general scheme mapped out as to how the work was to be done in all its details ?

A.—Only rough.

Q.—The whole thing calculated exactly of what quantities and what plant would be required ?

A.—I think the quantity as given in Sir George Buchanan's report of 1919.

Q.—Are they the only quantities you have ?

A.—We had no surveys, levels.

Q.—Had you designs of the quarry at Kandivlee ?

A.—No.

Q.—Or how the stones are going to be tapped ?

A.—No.

Q.—Or how the quarry is going to be worked ?

A.—Had not even a survey.

Q.—Did you have a design showing how the Colaba end of the reclamation wall is to be built ?

A.—No.

Q.—Did you in fact know, did you have any idea how it was going to be worked ?

A.—No.

Q.—Under those circumstances how was it possible to order the proper kinds and quantity of plant ?

A.—We thought it was a similar job as Mr. Lewis had done in Burma, and we went on that basis. I didn't have much to do with that.

Q.—Have you had any experience of carrying on works of this kind ?

A.—I was in Rangoon Port Trust.

Q.—Doing anything of this kind ?

A.—I was in charge of the quarry and was in Rangoon River Training Works.

Q.—Before that ?

A.—I was in Burma Railways.

Q.—That is construction ?

A.—Construction.

Q.—A very different thing from this ?

A.—Very different.

Q.—Did you have to buy a large plant ?

A.—I was only Assistant Engineer.

Q.—Would you agree with me now that the preparation of a full scheme showing in all its details how every part of the work is to be worked was absolutely essential before a proper plant could be purchased ?

A.—It was, but the dredger was already purchased. We had to get on with work. We knew that the dredger would be lying idle for at least 12 months.

Q.—Now, if you were a contractor carrying out this work, it would be absolutely essential for you to know exactly how much plant you want ?

A.—Yes.

Q.—Otherwise, if you did not buy enough money for your plant, you would lose thereby, lose heavily. On the other hand, if you ordered twice as much plant, you would not be successful in getting the work done profitably ?

A.—Yes.

Q.—Now, supposing this work had been carried out by a contractor who understood his business, would it not be absolutely essential for him to know exactly, not approximately but exactly, how much of every kind of plant he would require ?

A.—Yes.

Q.—Also the total cost of that plant ?

A.—Yes.

Q.—Do you think any contractor would have given a price for doing the work upon the materials available in 1919 ?

A.—No.

Q.—Quite impossible ?

A.—Quite.

Q.—Take the case of drains, there was no design for them ?

A.—No.

Q.—In Sir George Buchanan's estimate he put the cost down as 75 lakhs ?

A.—Yes.

Q.—Then subsequently it has been raised to 211 lakhs, about three times as much ?

A.—Yes.

Q.—If the contractor had undertaken the work for 75 lakhs, where do you think he would have been?

A.—Bankrupt, of course.

Q.—Would not the contractor know exactly what supervision it required before he started the work? He would calculate the number of Engineers, clerks, accountants, and everybody required?

A.—Yes.

Q.—Would not he design also how the crushing of stone should be done for concrete walls, and in fact every detail? I understand from you not one of these has been done?

A.—Not until I arrived here.

Q.—By which time the whole of the plant was purchased?

A.—Yes.

(The Committee re-assembled at 3 p.m. on 10th August 1926, all the Members being present, and continued the examination of Mr. O'Rorke)

Sir Frederick Hopkinson.—You told us this morning that you spent two and a half months in England?

A.—Yes.

Q.—What date was that?

A.—On the 4th September 1920.

Q.—Had you anything to do with the scheme before that date?

A.—No.

Q.—Were you appointed on the staff of this project before that date?

A.—No.

Q.—What did you go to England for?

A.—I saw Sir George Buchanan in his office in London. It must be in July 1920. He told me that he had recommended me for this appointment. Later on (I cannot remember when), I got a letter from Mr. Lewis saying he had arrived in London and had started work on the scheme at Messrs. Meik and Buchanan's office.

Q.—When Mr. Lewis told you that, was he Chief Engineer for construction purposes?

A.—Yes.

Q.—What did you do on September 4th?

A.—I went to his office and saw Mr. Lewis and found him busy on the plan of the Marine Line railway lay-out. He told me to come every day and help him in getting out specifications and inviting tenders for the plant we wanted.

Q.—I believe that that plant was subsequently ordered about the middle of October?

A.—Yes, I think so.

Q.—Therefore you had five weeks to prepare the list of plant and get in prices?

A.—Yes.

Q.—Did Mr. Lewis give you any general indication of the scheme for executing the work?

A.—Sir George Buchanan's report of 1919 was the basis of our work.

Q.—So that was all the information available at that time?

A.—I cannot think of any other.

Q.—Were any detailed plans prepared for, for instance, the storm water drains?

A.—None at all.

Q.—Were there detailed plans of the gantry?

A.—I think Mr. Lewis got one out in the office.

Q.—In other works there was none?

A.—Mr. Lewis got out a plan of the Marine Lines Yard.

Q.—Was that plan sent out to you to work with?

A.—I had never any.

Q.—Have you got any figures or any particulars showing how you arrived at the quantity of plant likely to be required?

A.—I have got none.

Q.—Did you do any of that work or Mr. Lewis did all?

A.—I think he did.

Q.—It was rather difficult because there were no plans?

A.—Yes, it was difficult.

Q.—You did not know whether storm water drains were going to be made in mass concrete or in blocks? Had you any information?

A.—None whatever.

Q.—Had you longitudinal section on the line of the reclamation wall?

A.—I do not remember seeing it.

Q.—Nothing showing how far it would be feasible to drive poles for the gantry?

A.—Nothing at all.

Q.—You spent two and a half months in making these preparations and then you came out here?

A.—Yes, I arrived in Bombay on the Xmas day.

Q.—I notice in the list of plant that subsequent to the first order, 100 trucks were purchased extra? They cost about £600 each?

A.—Yes, they were required. They cost something like £500 each.

Q.—When was that extra lot ordered?

A.—I do not remember. I think it was a year after our coming out.

Q.—Do you know why they were ordered?

A.—Because they told me they were going to require 2,000 tons of stone from the quarry.

Q.—Originally what did they want?

A.—I think 1,000.

Q.—So that in this interval their idea of progress had been multiplied by two?

A.—Yes.

Q.—I see that the first lot of wagons, 132 were ordered on the 25th October 1920, and the second lot 100 were ordered on the 10th of May 1922. That is about 18 months after.

A.—Yes, that is it.

Q.—So it points to the fact that either they did not give proper attention for doing the work or they found it necessary to practically double their requirements within a year?

A.—Yes.

Q.—The same thing applies to a lot of extra plant?

A.—Yes.

Q.—The whole of the plant seems to have been ordered in October and November 1920?

A.—Yes.

Q.—If these storm water drains had not been built in blocks, it would require a totally different plant than they had obtained for building in mass concrete?

A.—In most cases the plant could be adapted.

Q.—I say you would require quite different plant if you had build mass concrete?

A.—Yes, 10 tons but at Marine Lines we did not use 10 tons. It was gantry.

Q.—Then they would not have been required if you had built mass concrete?

A.—No.

Q.—If a contractor had been making an estimate for carrying out this work, do you think it possible that he could have made a proper and reasonable estimate upon the information available to you in September 1920?

A.—No, I do not think so.

Q.—Was there any specification, etc., for instance, the amount of cement required in the storm water drains?

A.—I do not think so.

Q.—Had you any knowledge of the total amount of work to be done?

A.—I think we knew approximately the length of the sea wall and the average cross section?

Q.—Did that give you the average between the wall at the Colaba end built of concrete on the rock and the same wall built on rubble mound at Marine Lines?

A.—It was decided to build the first 2,000 feet of the Kolaba Wall in mass concrete only after we arrived out here.

Q.—At that time in September 1920 you knew that it was going to be built on rubble mound?

A.—I think so.

Q.—I believe actually 8,000 feet was built of concrete with rubble mound?

A.—It was only 2,000 feet.

Q.—The other 6,000 feet on rubble mound?

A.—Yes.

Q.—Of course in doing that they would require a totally different plant?

A.—I think they used the same mixing plant and timber shutters.

Q.—Of course, if you suddenly increase your quantity from 1,000 to 2,000 tons of stones a day, the quantity of plant for the quarry would have been doubled?

A.—Not all of it; for instance we had one air compressor of 1,530 cub. ft. free air capacity and for the increased output required one to give an additional 500 cub. ft. only.

Q.—So that the first provision of air compressing plant was very liberal?

A.—Yes.

Q.—At that time Sir George Buchanan's estimate had been finished, the one amounting to 367 lakhs. Do you know anything about it?

A.—I had nothing to do with it.

Q.—Did you see any papers giving the details?

A.—No.

Q.—Who would know that, Mr. Lewis?

A.—I do not think so. I think Sir George Buchanan himself.

Q.—There must have been detailed estimate because he worked it out to 367·71 lakhs.

A.—It may have been but I do not know.

Q.—If he were imagining figures he would not have got 367·71. That was with the addition of details?

A.—I do not know how he worked them out.

Q.—At that time, in September 1920, when was it expected the dredger would start?

A.—It was expected at the beginning of the season 1923.

Q.—So that you had a year in order to make preparations to enclose the material you were going to dredge?

A.—Yes.

Q.—In this estimate of Sir George Buchanan is there any allowance made for cross walls to retain the material?

A.—I do not think there is any in his estimate.

Q.—Actually they had been necessary?

A.—Actually they were put in and then afterwards cut out again.

Q.—They are existing to-day?

A.—I think you will find in the report of Messrs. Meik and Buchanan that the cross walls are unnecessary.

Q.—How would you hold the material?

A.—I think they are necessary. I was not responsible for that.

Q.—You think they were absolutely essential? It was impossible to carry out the work without them?

A.—I say they were necessary to carry out the work properly.

Q.—And no allowance had been made for them in Sir George Buchanan's estimate?

A.—I think not. I am only speaking from recollection.

Q.—Who actually decided on the quantity of plant?

A.—I think Mr. Lewis. He was there in Mr. Meik's office and everything went up through Mr. Lewis to Mr. Meik.

Q.—Had Mr. Lewis anything to do with the decision about the plant?

A.—Everything was done by him. Mr. Lewis put up all such things to Mr. Meik who ordered the plant from the India Office Stores Department.

Q.—Then Mr. Lewis is the man who knows everything about the plant?

A.—Yes.

Q.—Do you think the estimate of 367 lakhs is anywhere near without going into all the details?

A.—I do not think so. At the time I did not consider this point but now from practical knowledge I think it was not.

Q.—Supposing you came out here as Sir George Buchanan came out, do you think you could possibly ask the Government to accept such an estimate as that?

A.—No.

Q.—Would a month here entirely put different ideas in your head?

A.—That is quite possible.

Q.—I suppose almost since you got here you thought the estimate was incapable of being realised?

A.—Yes, I think Mr. Lewis started a revised estimate immediately.

Q.—Did he finish it?

A.—Yes.

Q.—You know what amount he arrived at?

A.—No.

Q.—Was Mr. Lewis in Sir George Buchanan's office when he first started making the estimate?

A.—No. He was Superintending Engineer, P. W. D., Delhi, and was sent by the Government of India to take over this job. He had nothing to do with the original estimates.

Sir M. Visvesvaraya.—Was he not employed in Rangoon?

A.—I think he left Rangoon in 1912.

Q.—Was he employed there under Sir George Buchanan?

A.—Yes, as Executive Engineer, River Training work.

Sir F. Hopkinson.—Can Mr. Lewis give us any information of the 367 lakhs estimate?

A.—Yes. After he came out he practically doubled them.

Q.—Did he say anything else?

A.—No.

Q.—What do you consider a reasonable variation should be between the estimates between September of one year and middle of next year? Do you think it ought to vary more than 10 per cent.?

A.—I think it should not vary more than 20 per cent. It depends on the circumstances.

Q.—In the circumstances here?

A.—I do not think it should vary more than 20 per cent.

Q.—I mean putting in the same position in which Sir George Buchanan was?

A.—Yes. If I had all the information.

Q.—In fact all the information was not available?

A.—I do not think, it was.

Q.—Was it impossible for any person to make a reasonable and reliable estimate in 1919?

A.—In the circumstances I think it was.

Q.—Was it a wise thing for an engineer in the position of Sir George Buchanan to advise a non-technical body like the Government of Bombay to embark on a huge undertaking of this kind upon such an estimate what would you have done in such a case?

A.—I would have advised Government that the scheme was worth further investigation.

Q.—Do you think an engineer's reputation would suffer if he gave an estimate to work like that which was doubled in a year?

A.—Surely it would.

Q.—Very gravely?

A.—Yes.

Q.—One can understand if in such a case an engineer says, my approximate estimate is 367 lakhs but the details are not yet out but in all probability if you allow 10 or 15 per cent. margin you will be safe. In this case that margin would have been useless but no suggestion of margin was ever made by Sir George Buchanan. It stated definitely that the cost of the work would be 367·71 lakhs.

A.—Yes.

Chairman.—You told Sir Frederick Hopkinson that an estimate ought to be correct within 10 to 20 per cent., that is, with materials, labour, etc., at normal prices?

A.—Yes.

Q.—Were not prices very fluctuating?

A.—Very much indeed.

Q.—Your answer meant that in normal circumstances within 10 to 20 per cent. variation, the estimate should be correct?

A.—Yes.

Q.—But as regards the description of the plant, it did not matter whether you carried out the project in 1919, 1920 or in 1925? The plant would remain constant?

A.—Yes.

Q.—The prices in September 1919 to November 1920 and onwards were changing?

A.—Yes.

Chairman.—There are two words in the Indian language with which everybody is familiar. One is pucca and another is katcha. You know them?

A.—Yes.

Q.—These are used in many different senses. Katcha means incomplete, hasty, bad, ill-considered and is used in all these senses. Pucca means complete, good, careful,

well considered, well done, reliable. Was the estimate of plant as decided at Messrs. Meik and Buchanan's office, katcha or pucca?

A.—I would call it pucca.

Q.—The estimate of the plant required? Would you call it pucca?

A.—Yes. It was as good in the circumstances as we could prepare.

Q. You already said that as regards the description of plant you ought to know exactly what you wanted?

A.—Yes.

Q.—What was the difficulty in Sir George Buchanan's office in estimating exactly the plant if you had got a proper specifications?

A.—There would have been.

Q.—Was the estimate of plant prepared in Messrs. Meik and Buchanan's office katcha or pucca?

A.—At that time we considered it pucca.

Q.—You consider it katcha now?

A.—Yes.

(This concluded the evidence of Mr. O'Rorke.)

8th Witness

Mr. W. H. Thomas, Executive Engineer, Projects

Sir F. Hopkinson.—What is your full name?

A.—William Henry Thomas.

Q.—What is your position?

A.—Executive Engineer, Projects.

Q.—What does that mean?

A.—When the scheme first started there were a number of subsidiary works and minor parts of the job which required investigation, and it was considered that an engineer who would devote the greater part of his time to such investigations should be employed. There are not only works connected with the Back Bay Reclamation, but connected with the Development Directorate as a whole.

Q.—So that really part of your time has been devoted to Back Bay and part to Development? In other words, what you mean is, so far as Back Bay is concerned, you are partly employed in designing new works that had not been already designed. Amongst those would be storm water drains and any variations considered necessary during the progress of the works. These you would do under instructions from Mr. Lewis?

A.—Yes.

Q.—Have you been in that position from the commencement?

A.—From March 1921.

Q.—So that you are connected with this long before the works started?

A.—Yes. When I came in March 1921 we were just commencing the preliminary works such as the laying out of the sidings, putting up workshops and that sort of thing

Q.—When did you actually begin the wall at the Colaba end?

A.—I cannot say when the first piece of concrete was put in, but the work on that wall started in October 1921.

Q.—After you had been here six months?

A.—Yes.

Q.—During the six months you were making preparatory arrangements and you started the wall in October?

A.—Yes.

Q.—Have you got a longitudinal section of the reclamation wall showing the level of the rock throughout?

A.—I have got one here. That would not be quite up-to-date. There is a separate plan showing progress month by month—the plan I showed you the other day.

Q.—Where is that plan?

A.—In the Chief Engineer's office.

Q.—When can we have it?

A.—Within ten minutes.

Q.—Will you send for the progress plan and the plan showing longitudinal section on which the sea-wall was built?

A.—Yes.

Q.—Were you in charge of the construction of the sea-wall?

A.—Not of any construction. Not in the early days, but I am to-day. I am in charge of the whole work that is going on in the reclamation area apart from the actual dredging.

Q.—Which are the storm water drains that are in progress now?

A.—Two; one at the southern end of No. 2 block and one at the north end of No. 2 block on the lines which divide Nos. 1 and 2 and Nos. 2 and 3. Storm water drain No. 6 is just started. That is between No. 2 and 3 block.

Q.—There is nothing to prevent block one going on?

A.—Nothing.

Q.—You cannot build block 2 until storm water drain is finished?

A.—Not until the storm water drain is finished and a cross bund constructed.

Q.—What would the cross bund be built of?

A.—Moorum protected by rubble pitching on the sea side where it is subject to the monsoon seas coming through the gap in the wall.

Q.—Have you got plans to show us the borings taken in Back Bay?

A.—Yes.

(A plan was handed in by witness.)

Q.—These are the borings taken in Back Bay. At what time?

A.—In 1922. We made washborings in 1922 and in the following year further borings with a drill were made.

Q.—What is the number made there, 69?

A.—One boring should have been made at the spot where the number is.

Q.—Here you have got an area divided into a certain number of squares, and at certain points in those squares you have got numbers from 1 to 69. Does that mean there were 69 borings made for that area?

A.—No, Sir. It means we proposed to make 69 borings.

Q.—And how many did you make with the water jet in 1922?

A.—We went as far as 63. On each point where there is a number it was proposed to put down one boring. And in 1922 we went from 1 to 63.

Chairman.—Did you make 63 separate borings then?

A.—No. I have not the actual number. We only took borings on alternate points towards the end of the season.

Q.—Can you tell me how many borings were actually made? If you did alternate points you approximately did 31. How many in fact did you do? And of how many you have got a record?

A.—40.

Q.—Have you got particulars of those borings?

A.—Yes, they are given in the statement handed in.

Q.—Where are the measurements made from?

A.—The first measurement in the plan is from the sea bed. The sea bed is zero in each case.

Q.—Did you put washborings through, in this particular case 8′ 6″ of hard clay? (Referring to a particular case in the plan.) You have given a description. You call it hard clay. Did your washborings penetrate 8′ 6″ of hard clay? No amount of washing would disturb that. I cannot believe you could ever make washborings with material of that kind (referring to a core of hard clay which witness produced).

Chairman.—Sir Frederick says no washboring could ever penetrate into this and bring it to the surface. What do you say?

A.—No, it would not bring it to the surface, but a strong jet would wash and wear that away and enable the pipe to come down.

Sir F. Hopkinson.—In what time? Water will wear away anything if you give time enough. Do you really suggest that you made a washboring through 8′ 6″ of that material and did the tube go down? Did you actually see these borings made yourself?

A.—During some part of everyday I saw some.

Q.—Did you actually see these washborings go through from 3′ to 8′ 6″ of hard clay? I never did. I do not think anybody else did. When were these borings made?

A.—They were made between January and April 1922.

Q.—And the other borings?

A.—Between December 1922 and May 1923.

Q.—Why did you make borings out there?

A.—The Chief Engineer was rather concerned about the possibility of filling in blocks 1 and 2 from the harbour. It would require an extremely long pipe line and an expensive lay out to cross the island from the harbour. I believe also that he had

been told by officers of the Port Trust that a large amount of the soft material in the harbour was useless for reclamation purposes.

Q.—And so he thought it desirable to find out if it was possible to supplement the filling from Back Bay?

A.—Yes.

Q.—Was not the "Kalu" purchased 3 years before this, in 1919?

A.—Yes.

Q.—What for was it purchased?

A.—The particular purpose was that it could work independently on the east Colaba reclamation.

Q.—And that work was not carried out?

A.—No.

Q.—Do you know why?

A.—I think it was in view of the doubts which Government entertained about the disposal of the land on this side, and so they decided that before they carried on the east reclamation they should complete at any rate a portion of the western reclamation and judge of the necessity of carrying out the East Colaba scheme.

Q.—But in a letter from Mr. Lewis dated 20th February 1923 he says it was previously understood that the "Kalu" would work in the same area as the "Sir George Lloyd" and would utilise the same auxiliary. This is not possible with a dredger working at opposite sides of the Peninsula. According to that it was intended that the "Kalu" should pump into block 8.

A.—I do not think it was quite the intention in that letter. When the scheme was originally put forward the intention was to have 5 pipe lines across the island. Then that was reduced to 3, which still left them with a very long lead from the 3rd pipe line down to the end of this reclamation, and it was for the long lead that it was proposed to utilise the dredger "Kalu" with the "Sir George Lloyd".

Q.—Why did they abandon the two pipe lines?

A.—On the ground of expense and the inconvenience that would be caused by attempting to lay pipes of that description through the city.

Q.—Do you think that had been considered in 1919?

A.—I do not think it had been given the amount of thought that should have been given.

Q.—Do you think the estimate included the carrying of the pipe lines through the heart of Bombay?

A.—I cannot say.

Q.—The Colaba reclamation would have been quite a simple one. Pumping was quite close?

A.—Yes.

Q.—And then you might have realised the dream of pumping 2,000 cubic yards an hour?

A.—Yes.

Q.—Those figures which you handed in today, do they give the borings of the core drilling as well?

A.—No, Sir, only the wash drill.

(Figures with regard to core drillings in Back Bay were handed in by witness.)

Q.—In this case you apparently drilled right down to the rock?

A.—Yes.

Q.—And you got depths from in one case 7 feet, and generally from about 12 feet to 24 feet.

A.—Yes.

Q.—What quantity would that give you in the area selected?

A.—I cannot speak from memory. It is given on the front page of the Report.

Q.—It gives 25 million cubic yards.

A.—Yes, something like the whole filling required.

Q.—I understood there was only a couple of million yards available in Back Bay. There is enough material to finish the whole scheme?

A.—That is only from the point of view of quantity. But I fear a large proportion of that area was ruled out on account of the shallow depth.

Q.—But you were going to make your own floatation?

A.—The depth of soft material in some place does not give sufficient depth for the dredger.

Q.—What does the "Kalu" draw?

A.—The "Kalu" draws 9′ 6″.

Q.—Is the surface exposed to low water?

A.—I think not.

Q.—You have always got 12 feet at high water and several feet at low water. And if you dredge away 12 feet you have got plenty of water for floating? Are you satisfied that you could get 25 million yards from this area shown on the plan?

A.—I am satisfied that there are so many yards of material other than rock.

Q.—Are you satisfied you could get that quantity? Is it possible to dredge it economically?

A.—In view of our experience of dredging I think not. Because the dredger does not seem to be capable of doing anything in the nature of hard clay.

Sir Frederick Hopkinson.—Is not the "Kalu" of the same type as "Sir George Lloyd"?

A.—Yes.

Q.—I should agree with you, but when that clay is in water for centuries, it is softer. It is not like that in the sea-bed?

A.—When it came up it was very very stiff.

Q.—But not hard?

A.—No.

Q.—How much did the "Kalu" do per pumping hour last season?

A.—I do not know the figure.

Q.—This is a longitudinal section of the sea-wall, but this only shows the surface of the ground. It does not show whether it is rock or whether it is soft material, does it?

A.—No, Sir.

Q.—No provision at this time had been made for the storm water drains? So that, although you got the dredger there and although you got the wall built you could not begin the dredging, because the storm water drain had not been built. Why not have built the storm water drains first of all? You knew it had to be done?

A.—It had been overlooked.

Q.—It is an expensive overlooking. That accounts for the tying up of the dredger for 18 months.

A.—I think it one reason why the dredger could not have started in October 1922 or December 1922.

Q.—Did Sir George Buchanan overlook this?

A.—I think he did overlook it.

Q.—How long is the storm water drain at Block No. 8?

A.—The whole length of the bund from shore line to wall is 4,320 ft.

Q.—How long is the drain itself?

A.—2,320 feet.

Q.—What is the diameter?

A.—It is from 5 feet to 8 feet.

Q.—Do you mean all the storm water drain had been overlooked?

A.—I think the necessity for storm water drains or rather of constructing them before the filling in was done was overlooked. There is a letter in the correspondence with Meik and Buchanan referring to this.

Chairman.—Your recollection appears to be right about this matter, as it is confirmed by the Chief Engineer's letter of the 25th August 1923. Is that the letter which you had in your mind?

A.—No, not that letter alone. There is another from Sir George Buchanan.

Q.—The mere effect of filling it in would prevent the then existing storm water drains from working and Bombay would be flooded?

A.—We had realised that.

Q.—When did you realise that?

A.—We realised it in I think March 1921. Then we started to design the storm water drain.

Q.—The fact remains that the dredging could not commence before the end of 1923 because there was no room available to put in the dredgers?

A.—Yes.

Sir Frederick Hopkinson.—You are in charge of the unloading of the moorum?

A.—Yes.

Q.—That is all done by contract?

A.—Yes.

Q.—What price do you pay for it?

A.—The actual price for unloading paid to the contractor is two annas a ton, including track shifting, and the shunting price 2 annas 9 pies per ton.

Q.—That is the total cost of the material when it reaches you?

A.—That is the bare cost plus the supervision.

Q.—You are also laying the pipe for the delivery of the pump?

A.—No. I am building a bund for the delivery pipe to be laid on.

Sir M. Visvesvaraya.—What exactly are your duties now in the department?

A.—My duties are the charge of all works apart from dredging in the reclamation area and that is mostly confined to dry filling and the construction of storm water drains and the maintenance of the works.

Q.—You have an Executive Engineer in charge?

A.—No.

Q.—You said that you were in charge of the projects division.

A.—That was formerly, yes.

Q.—What material do you use to bring the bunds to a higher level?

A.—Moorum.

Q.—You said that out of five pipe lines two were abandoned?

A.—Because they were very expensive and secondly they would have to be taken through the busiest parts of the city.

Q.—Of the remaining three pipes how many are now in use?

A.—One.

Q.—Do you hope to use the other two?

A.—We propose to use one more. The third one has been practically abandoned.

Q.—Can you tell me whether the "Sir George Lloyd" and the "Colaba" can together pump into block 2?

A.—I do not think so.

Q.—Why?

A.—Because the distance between "Colaba" and block 2 would be too great.

Q.—Much less can it pump into block No. 1?

A.—Yes.

Q.—Then the "Kalu" and the "Jinga" are intended for blocks 1 and 2?

A.—Yes.

Q.—By what means do you hope to fill block No. 3?

A.—The intention is from the Back Bay, I believe.

Q.—What about No. 4?

A.—I think the possibility of filling No. 4 by dredging is getting more and more remote

Q.—Were you connected with the original estimate, namely of 702 lakhs?

A.—Yes.

Q.—You know the present rate of dredging from the Back Bay is Rs. 1-3 per cubic yard?

A.—Yes.

Q.—And from the harbour it is now Re. 1 or less?

A.—It is 10 annas.

Q.—Moorum filling costs you now Rs. 1-8?

A.—Rs. 1-5.

Q.—You want in all 28 million cubic yards?

A.—Yes.

Q.—And at Rs. 1-5 it will be less than 400 lakhs?

A.—Yes.

Q.—The dredger and the cost of dredging in the 702 lakhs estimate come to about 472 lakhs or nearly 5 crores in the estimate given in the Development Director's note?

A.—The estimated total is about 11 crores.

Q.—It is 925 lakhs excluding interest charges. If you had resorted to filling in the ordinary way by using the railway, you might have completed it cheaper than by using dredgers?

A.—If it had been resorted to in the first instance. Yes.

Q.—Would you suggest that dry filling could be found?

A.—It is a difficult thing to answer that question. I think the hills of Salsette would yield the required quantity.

Q.—You have 1,100 acres here. There are many times this area in Salsette and if Salsette will not satisfy, you will have to go to Thana side *via* Dadar. But I think the Salsette site would produce all you require. If a scheme had been originally made and an estimate prepared for bringing moorum from Salsette, do you think you could have completed it for about 400 lakhs?

A.—Yes.

Q.—You should have approached the work originally and you should have gone into the figures?

A.—We did not go into the figures for dry filling because we relied on dredge filling. All is due to the failure of the dredging estimate.

Q.—Is not dredging with the "Kalu" costing practically as much as bringing moorum or earth?

A.—Yes.

Q.—Where is the necessity for going in for dredging?

A.—The chief reason is, I think, in order to expedite the completion of the first blocks.

Q.—But the quantity you are getting is very small. From the "Kalu" you get about 4 lakhs of cubic yards a year?

A.—Yes. But that all helps towards completing the blocks at an early date.

Q.—Now that "Kalu" has been purchased you want to make some use of it?

A.—Yes, if it can be economically done?

Q.—How do you check the quantities that are completed whether for dry filling or dredged filling?—The only method of checking, whether dry filling or dredged filling, is by taking sections at the beginning and end of a given working time?

A.—It is practically impossible to check dry filling mainly by that.

Q.—Much of it may be wasted?

A.—Not now, because the whole area is bunded up.

Q.—Can anything go through the cross wall?

A.—No.

Q.—Even when you take cross sections and measure the quantities, much of the stuff is liquid mud. What allowance do you make for shrinkage?

A.—That is a matter of experience and the Chief Engineer has suggested that 15 per cent. is ample provision for that.

Q.—You can only get that at the end of the year and again you can total the quantity when the whole work is completed?

A.—Yes.

Q.—You will not have quite accurate quantities delivered until then?

A.—No.

Mr. Billimoria.—Who recommended you for this job?

A.—The appointment was advertised, and I think out of 40 or 50 applicants I was selected for the appointment.

Q.—Had you any previous experience before you came to this job of reclamation work?

A.—On reclamation work, no.

Q.—What was your experience as an Engineer?

A.—I was started as an Engineer after five years' apprenticeship. After this I attended a technical course in London, three years after which I joined a firm in London as Chief Assistant when the war broke out. I was in war service as a Royal Engineer.

Q.—What has been your practical experience?

A.—My real practical experience was during the war when I was in charge of the construction of piers, quays and wharves with the army in Salonika. After the war I came here.

Q.—Were you directly under the Superintending Engineer receiving orders from him or were you independent of him working here?

A.—I was directly under the Chief Engineer's orders.

Q.—You had nothing to do with the last witness?

A.—No.

Q.—Were the storm water drains mentioned just now taken into consideration when the estimates were prepared by Sir George Buchanan, I mean his estimate of 367 lakhs?

A.—I believe he allowed a lump sum for roads, lights and drains.

Q.—Did you see his estimates?

A.—Yes, I have seen them.

Q.—Did you see any item pertaining to storm water drains?

A.—I believe there was an item for roads and sewers.

Chairman.—Does that include storm water drains passing out into the sea?

A.—It does not.

Q.—It could not have been in the original estimate, because when the budget was prepared for 1923-24 this item was put in.

A.—It was included in the first estimate which the Engineer Mr. Lewis made during 1921 which was sanctioned I think in May 1922. That was in the project estimate of 702 lakhs.

Q.—I am talking of the first estimate of 367 lakhs made by Sir George Buchanan and on which this scheme was launched?

A.—I do not think there was any separate mention of storm drains.

Q.—You just now told us there was?

A.—I believe there was a lump sum estimate for drains and sewers.

Mr. Billimoria.—What do you think would be the cost of these storm water drains?

A.—They are of varying sizes and lengths. But the nine drains costed about 26 lakhs.

The Chairman.—About £180,000.

Mr. Billimoria.—Is that included in 211 lakhs you showed in the present estimates for roads, lighting and drains?

A.—Yes.

Sir M. Visvesvaraya.—A provision of 27·67 lakhs for drains we have got in the new estimate. Are these for the cross drains?

A.—No. 27·67 lakhs are for sewers.

Mr. Billimoria.—You said that the cost of these would be 26 lakhs. How many drains do you require in each block?

A.—One main drain for each block.

Q.—If such an important item as storm water drains was not included or provided for in Sir George's estimate, that estimate would be defective and inaccurate—I mean the estimate of 367 lakhs?

A.—Yes, if that has not been provided for.

Q.—Why was such an important item overlooked?

A.—I cannot say.

Q.—Did it strike any of the Engineers working on the scheme?

A.—Yes.

Q.—When did it strike them and why was it overlooked so long?

A.—As far as I can remember it was discovered about July 1921 when work on the designs of storm drains was commenced.

Q.—You know very well that an important project had been sanctioned, that orders had been placed for the dredger which was to commence operation immediately. Why was not precaution taken?

A.—No work on the storm drains had been commenced.

Q.—Were no actual plans prepared and left by Sir George as to how and what work was to be carried out?

Mr. Billimoria.—If he was the actual responsible Engineer in charge of the entire scheme, did he leave any plans or programme of work?

A.—Not to my knowledge. The general programme was that 3,000 feet of wall should be constructed at each end each season. That was the general scheme. There was no detail.

Mr. Billimoria.—Was it a slipshod method of work or was a programme ready and work carried out according to it?

A.—As far as we are concerned, there was a definite programme of work for each year prepared by the Chief Engineer.

Q.—Who drew up your programme?

A.—The Chief Engineer, Mr. Lewis.

Q.—Was that under Sir George Buchanan's instructions?

A.—That I do not know.

Q.—Did that programme provide for storm water drains?

A.—Yes. After 1922, when the question of constructions was thoroughly gone into.

Q.—Till then, the Department was sleeping and never thought of it?

A.—I do not say that. In July 1921, the work on the designs of the storm water drains was commenced. Work was always going on on the storm water drains after 1921.

Q.—Before 1921?

A.—In July 1921 we started work, but it was quite possible that it might be in the mind of the Chief Engineer before that. He had more work than he could deal with, and he could not start till July 1921.

Q.—You have practical experience about dry filling. Would it be a financially sound proposition to start dry filling over such a large area as 1,145 acres of land on an open sea front?

A.—It would depend on the rate at which dry filling is carried on.

Q.—How long would it have taken? Fifty years or one hundred years?

A.—I should give it as ten to fifteen years in the present case.

Q.—I suppose from your practical experience you know that wet filling is always cheaper than dry filling and is more expeditious?

A.—That has not been proved to be so in the present case.

Q.—Not in the present case, but in actual experience?

A.—It depends entirely on circumstances.

Q.—Upon a large area?

A.—Yes. It depends on circumstances.

Q.—You would not commit yourself to the statement that wet filling is cheaper than dry filling?

A.—No; as I said it entirely depends on circumstances.

Q.—Do you think that the present area is capable of being filled by dry filling and the reclamation completed ?

A.—Yes.

Q.—Are there any circumstances which warrant the belief that the present area of 1,145 acres could be reclaimed by dry filling ?

A.—I think they can be reclaimed.

Q.—Have you got material sufficient enough to do that ?

A.—We have not been able to go into a detailed reconnaisance.

Q.—You think it is feasible ?

A.—I do.

Q.—Where do you get the material from ?

A.—From Salsette.

Q.—What about transport ?

A.—Either by the G. I. P. or B. B. & C. I Ry.

Q.—Without disturbing the traffic ?

A.—Without disturbing the traffic.

Q.—How much would you bring every day ?

A.—At least six train loads ; probably double.

Q.—How long is it going to take to complete this 1,145 acres ?

A.—About fifteen years.

Q.—When do you expect the block to be ready for building purposes ?

A.—Within twelve months from the time of completion of the filling.

Q.—Can you give us any estimate as to what the cost of that would be ?

A.—No ; but you can take the unit rate at 1 rupee 3 annas per cubic yard as being the price.

Q.—That would not take interest into account. If you calculate interest at 6½ per cent. for fifteen years, do you think it will be a paying proposition ?

A.—It depends entirely on land valuation at the end of fifteen years.

Q.—You have no experience of land values ?

A.—No.

Sir Frederick Hopkinson.—Has the bund of No. 7 block been already made ?

A.—Not made.

Q.—When is it going to be made ?

A.—The question of filling in block No. 7 has not yet been sanctioned ; the bund will be taken up after that.

Q.—You cannot do any dredging until the bund is finished ?

A.—No.

Q.—How long will it take to finish the bund ?

A.—I think we estimated it at three months.

Q.—You do not begin lining the roubble mound. You can do that at the same time ?

A.—We have a limited amount of rolling stock working ; it will take six weeks in addition.

Q.—Will the dredging be finished in the first two weeks ?

A.—The very first day.

Q.—Right across ?

A.—Yes.

Q.—Why do you put so much murum on the rubble bund ; you have got an enormous bund about 35 feet wide ?

A.—Yes at Colaba, at Marine Lines no ; but circumstances are different here. At Colaba the bank is wide because additional dry filling has been tipped from the wall.

Q.—At Colaba where No. 7 block is, you have got to blind the reclamation bank. Now why do you not make it 3 feet as originally suggested by Mr. Lewis ?

A.—It will wash away.

Q.—You can fill No. 7 block in a very few days ; if you get your bund made right across and with 3 feet of filling behind the reclamation bank you can fill the whole block in a few days ?

A.—Yes.

Q.—The water will support the moorum.

A.—It is a question of the two things working together ; if these operations go on simultaneously it will be all right.

Q.—How much would be required in No. 7 block for blinding the mound ?

A.—I think 10,000 tons.

Q.—That is fifty days' work ?

A.—Yes.

Q.—How long will it take to construct the cross bund ?
A.—About three months.

Q.—How are you going to do it ?
A.—It is proposed to do it by end tipping.

Q.—You cannot do more than 1,000 tons a day ?
A.—With all the waggons we can do 2,000 tons a day.

Q.—But you can tip only one waggon at a time.
A.—We can empty one hundred waggons in a day.

Q.—What do they carry ?
A.—They carry 7½ tons ; they are 7½ cubic yard waggons.

Q.—Have you got a cross section right across the land up to the reclamation wall, a cross section showing the surveys ?
A.—I think one does exist.

Q.—What is the level of the reclamation site horizontal, across or higher up the sea at the sea end ?
A.—It is 91 at the shore end, and 94 at the sea end.

Q.—The sea end is 3 feet higher than the shore end ?
A.—Yes.

Q.—If it had been lower ?
A.—There was the alternative ; if the ground level were 3 feet lower and the parapet wall was only 3 feet, then there would be trouble in monsoon time ; water would go over the top of the wall.

Q.—Why should not the higher parapet be adopted ?
A.—If the higher parapet be adopted, then people behind the parapet would be within a sort of prison wall.

The witness withdrew, and the Committee rose for the day.

The Committee assembled at 11 a.m. on Thursday, 12th August 1926, the Chairman, all members and Secretary being present

9th Witness

Sir Leslie Hudson (Bombay Chamber of Commerce)

Written statement of the attitude of the Bombay Chamber of Commerce towards the Back Bay scheme

Shortly after his arrival here on the 16th December 1918, Sir George Lloyd's attention was very strongly attracted to the crowded and insanitary condition of the dwelling places of the labouring classes in Bombay and on many occasions he expressed his desire to have matters improved. At that time the Mill industry of Bombay was flourishing exceedingly as were other local industries and as a consequence there was a great influx of labour into Bombay and the living conditions of these people were certainly very bad, so much so that mills which wanted to work on double shifts were prevented from doing so because of the housing shortage. It must be remembered that at that time the boom of prosperity was nearing its peak and prospects for the coming years bore no sign of the subsequent collapse and of the depression in all branches of trade which still continues.

As a result of the Governor's efforts the development of the north of the Island and the Reclamation of Back Bay were decided upon. Sanction was obtained from the Secretary of State for the latter project and the schemes were proceeded with with great vigour. The former project was mainly to provide accommodation for the accumulated mass of labour and of the clerical classes away from the ill-built, ill-designed and insanitary precincts in which these people were crowded. The Reclamation was to provide building and breathing space for the occupants of the crowded spaces in the Fort area at a price which would put a stop to the soaring land values in that area where at that time it was extremely difficult to obtain Office or living accommodation.

Contrary to the usual practice no reference of any sort was made by Government to the Chamber of Commerce for their opinions on the scheme at this or any subsequent time. The Back Bay Reclamation scheme was prepared in silence over a period of 18 months without, so far as the Committee are aware, public opinion having been once consulted. It was launched in the Legislative Council together with the industrial housing and Salsette development schemes by means of a Bill further to amend the City of Bombay Improvement Act, 1898, and the City of Bombay Municipal Act, 1888 (Bill No. VII of 1920), the object of which was to secure funds to carry out these various schemes. The Bill was introduced by His Excellency the Governor himself on August 3rd, 1920, read a first time and referred to a Select Committee on the same day. On September 29th, it was read a second and third time and passed into law. It is apparent that the Bill was passed through Council with the minimum of delay and that little opportunity was given for public discussion.

It must be admitted that on Sir George Buchanan's original estimate of Rs. 367 lakhs, published in September 1919, the scheme appeared an attractive one with land values standing at the level they did at that time. Nor had the Chamber which had not been furnished with details, any reason to doubt the soundness of the figures in the estimate. Subsequently the Development Directorate was constituted and revised this estimate, the figure being raised to 702 lakhs. The Advisory Committee was then formed and the Chamber was given a seat on it. In view of the large increase in the estimates and the serious decline in land values which had occurred in the meantime, the Committee in 1921 were anxious to obtain more detailed information and endeavoured to do so through their representative on the Advisory Committee. They were informed, however, that questions relating to the general policy of Government could not suitably be discussed by a body whose functions were purely advisory, and the matter dropped. The Annual Administration reports issued by the Development Directorate were couched in reassuring terms and serious doubts as to the success of the scheme were not entertained until last year when sinister rumours became current and were speedily confirmed by the publication of the report of the Advisory Committee.

In regard to the past history of the Back Bay Reclamation the points which the Committee desire to emphasize are :—

(1) The wholesome practice of consulting commercial opinion was departed from.
(2) The scheme was matured and carried out behind a veil of official secrecy.
(3) This Chamber has always been opposed to State control of works which can more properly be entrusted to private enterprise. The Committee think the Reclamation could have been done better by private contractors than departmentally.

In regard to the future the Committee adhere to the views expressed by their representative in Council in March last, *viz.*, that the work should be continued on blocks 1 and 8 and probably 2 in accordance with the recommendations of the *ad interim* report of

the majority of the Advisory Committee. When these blocks have been completed the position can be reviewed in the light of the experience which will by then have been gained. The Committee are of the opinion that eventually the whole of the Reclamation will be completed but whether this will be a matter of 15 or 50 years they are unable to say. In any event they would recommend that the work should be proceeded with cautiously, so far as possible according to the result of each season's work and the rate at which land can be disposed of for building purposes both in order to obtain early some return on the capital outlay and to avoid undue disturbance of land values by throwing large areas on the market at one time. The Committee are also of the opinion that the possibility of winding up the Development Department and handing the work over to private enterprise should be gone into although they realise that this may be commercially unsound in view of the large amount of capital which has been locked up in plant, tools, railway materials, etc.

There is one more point to which the Committee attach importance. In a city so congested as Bombay the provision of open public places and play-grounds is essential to its health and well-being and the Committee are of opinion that Government are justified in spending a limited amount of public money for this purpose provided, of course, that land can be reclaimed and thrown open to the public at reasonably low rates.

Chairman.—Sir Leslie Hudson, are you submitting to the Committee a statement of the Chamber's attitude towards the Back Bay Scheme?

A.—Yes.

Q.—We have all had the opportunity of reading it, and I have only a few questions to ask you about it. How long have you been associated with Bombay?

A.—Of late years, the last 11 years.

Q.—And for how long have you been a member of the Chamber of Commerce?

A.—As a member of the Committee, I think for the last 4 or 5 years.

Q.—Who at the moment is the President or Chairman?

A.—Mr. Kay.

Q.—Your statement commences by saying, " Shortly after his arrival here on the 16th December 1918, Sir George Lloyd's attention was very strongly attracted to the crowded and insanitary condition of the dwelling places of the labouring classes in Bombay and on many occasions he expressed his desire to have matters improved." In 1918 was there very considerable pressure as regards housing accommodation?

A.—Very.

Q.—And was the position such that if any reasonable scheme could have been found to relieve the congestion, that scheme, in the opinion of the Chamber of Commerce, should have been undertaken?

A.—Yes, Sir.

Q.—Had there been for some few years prior to 1918 a very large influx of people into Bombay?

A.—I should say the great influx started in 1918.

Q.—Can you give an approximate figure?

A.—I am afraid I cannot give anything like an accurate figure, Sir.

Q.—Could you give a percentage?

A.—I am afraid it will only be a guess. I should say, possibly as much as 20 per cent.

Q.—20 per cent.?

A.—Yes.

Q.—What approximately was the population in 1917?

A.—I am taking it as about 850,000. That again is a guess, Sir.

Q.—And even with a population of 850,000 in 1917, was there considerable hardship as regards housing conditions of the poorer classes?

A.—In 1917, yes.

Q.—I will repeat my question, as regards the housing conditions of the poorer classes, were the conditions of living very bad?

A.—The cost of living was already rising very considerably, and there was overcrowding amongst the labouring classes, and the conditions in 1917 were probably not very much worse than in the years immediately previous. It is subsequent to 1917 that the pressure came.

Q.—And did that in your opinion provide the main reason for the necessity of finding some accommodation if it could be found?

A.—That, in my opinion, was the main reason.

Q.—Your statement says, " As a result of the Governor's efforts, the development of the North of the Island and of the Reclamation of the Back Bay were decided upon." In fact, the question of the reclamation of the Back Bay had become prominent in December 1917. Had it not?

A.—I am afraid I was not aware of it at that time.

Q.—Will you take it from me, we have had proof that in December 1917 a Syndicate asked for a concession, and on the 19th December Messrs. Tatas also wanted an option in the Reclamation of the Back Bay? You may also take it from me that Sir George Carmichael had interviews with both the Syndicate and the firm of Tatas, who agreed to work together, and Sir George Carmichael wrote an official note summarising the position, and I will read to you an extract from that note and ask whether in your opinion that fairly expressed the position then. The note is a very long one, and I will read only the part which is important, and that is this: "There are men of sound judgment in Bombay who think that it would be a profitable scheme for Government to take up soon after the War is over." Sir George Carmichael is writing the note on the 28th April 1919, at which date there was no indication that the War was coming to a conclusion in that year. "But there would be a strong body of opinion the other way and there is no doubt in my opinion that if we wish to avoid delay we should leave the project to private enterprise. Government will after the war have many more urgent claimants on their revenues." I take that step by step. Do you think Sir George Carmichael was right in saying that there were men of sound judgment in Bombay who thought that it would be a profitable scheme to take up soon after the War was over?

A.—I think that is so.

Q.—On the figures as subsequently given by Sir George Buchanan, the scheme appeared to be most suitable?

A.—Yes.

Q.—Then Sir George Carmichael continues, "but there would be a strong body of opinion the other way." Is he right in thinking in 1918 there was a strong body of opinion?

A.—I think so, the vested interests.

Q.—By vested interests, are you referring to people who would not wish to find a large area of building land suddenly open to the residents of Bombay?

A.—Yes, for the reason it would depreciate their property.

Q.—And then Sir George Carmichael says that "if we wish to avoid delay, we should leave the matter to private enterprise." Do you think that that was a sound recommendation?

A.—My Committee are in favour of private enterprise as opposed to State.

Q.—Very well, all the matters I have been speaking of in relation to the Syndicate and the firm happened before Sir George Lloyd came out, and on the 16th October 1918, the Government of Bombay wired to the Secretary of State saying that the re-examination of the Back Bay Scheme was a matter of special urgency and asking the Secretary of State to choose the best qualified man available to come out and advise on the matter. That again was before Sir George Lloyd came out here. He arrived on 16th December 1918?

A.—Yes.

Q.—And so the passage in your statement that "as a result of the Governor's efforts the development of the North of the Island and the Reclamation of Back Bay were decided on" is correct in so far as the decision was taken by Sir George Lloyd's Government, but the wish to investigate the scheme was commenced by Lord Willingdon's Government?

A.—Yes.

Q.—Now we come to an important passage. "Contrary to the usual practice, no reference of any sort was made by Government to the Chamber of Commerce for their opinions on the Scheme at this or any subsequent time". Is the Chamber of Commerce a large and representative body?

A.—Yes, Sir.

Q.—Has it very big interests in the City of Bombay?

A.—Yes.

Q.—And has it the prosperity of Bombay deeply at heart?

A.—Certainly, it has.

Q.—Was the proposed Reclamation of Bombay a Scheme to which your Chamber would have given great assistance?

A.—Certainly.

Q.—Would your Chamber have studied all the details and endeavoured to come to an opinion as to whether it was a good scheme or a bad scheme?

A.—They would have been unable to go into all the details, Sir, but from the financial side they would certainly have formed a judgment as to whether it would be a successful project.

Q.—They would look into the matter from a business point of view?

A.—Yes.

Q.—And would have studied all the materials that might have been put before them?

A.—Everything that would be put before them.

Q.—Would it have been a feasible plan to invite representatives from the Chamber of Commerce and from other representative bodies including the Port Trust and the Indian Marine and obtain their opinions?

A.—The usual methods of obtaining the opinions of such bodies is for Government to circulate a notification or a communique and ask for their opinions thereon. As to forming a Committee of the persons who were mentioned I do not think that that would be a better way of getting the opinion of every body than the usual method of sending a communique.

Q.—If they had sent a communique to the Chamber of Commerce, they would have got the opinions of a body of business men?

A.—Yes.

Q.—If they had sent a communique to the Port Trust they would have got the opinions of Marine Experts and similarly those of the Royal Indian Marine?

A.—Yes.

Q.—And the Port Trust and the Royal Indian Marine could hardly have failed to have told the Government that they would have to limit the area of dredging?

A.—With the details before them they could not have failed to do so.

Q.—You say with the details before them the Port Trust and the Royal Indian Marine could not have failed to tell the Government that they would have to limit the area of dredging?

A.—Yes, Sir.

Q.—Moreover with all the details before them, the Port Trust could hardly have failed to have given their experiences of dredging in the years 1909—13?

A.—I should imagine so, Sir.

Q.—If they wished to assist the Government with all the information in their power, that would have been an essential thing to set out?

A.—Yes.

Q.—From 1909—13, they had been using a Suction Dredger in the Harbour, and the details, if communicated to them, would have disclosed that the scheme was to use a Suction Dredger in the Harbour?

A.—Yes.

Q.—And in giving to the Government their experience of the workings of the " Kalu " and the " Jinga ", presumably they should have included the cost. A business man will include the cost?

A.—A business man will include the cost, Sir.

Q.—Now the Chamber in the statement which lies before us have laid some stress on the quietness with which this matter went through?

A.—That is so, Sir.

Q.—And on the 15th July 1921, Sir George Curtis, speaking at the Royal Society of Arts on the Scheme, explained to some extent why that was done. One of the reasons for secrecy was given that, had the proposal become generally known, there would have been considerable speculation in land—but I don't know whether you can tell me, Sir Leslie—did the Government require to take up much land for this particular scheme of Reclamation?.

A.—To take up land?

Q.—Yes, to acquire much land?

A.—No, I think not very much. Possibly Sir George Curtis had in mind question of speculation in the new land when reclaimed, Sir.

Q.—But speculation in the new land when reclaimed would not hurt Government at all if the Government had got the price that they wanted?

A.—Exactly.

Sir M. Visvesvaraya.—Did they propose to locate the future Government House there?

A.—I don't think so. I have only seen a map of the proposed area, and I don't think that included a Government House.

Chairman.—Sir George Curtis explained that the whole scheme had to be carried out departmentally as, owing to fluctuations in the price of machinery, materials and labour, it was impossible to get a contract on satisfactory conditions. If the details had been submitted to the Chamber of Commerce, would not the Chamber of Commerce have taken into consideration the very fluctuating price of materials as one of the circumstances to be considered?

A.—I think so.

Q.—A scheme which may be quite financially sound in normal times may in conditions that prevailed in 1919 have a certain element of risk?

A.—Yes.

Q.—In 1919 the Chamber would have had to balance the urgency of the situation as regards getting more land for the scheme as against the risks of fluctuating prices which prevailed at the time?

A.—Yes.

Q.—Now, we know that it was necessary to have an amendment to the statutes, the City of Bombay Improvement Act and the City of Bombay Municipal Act, and on August 3rd, 1920, the bill was introduced by Sir George Lloyd. Are you able to say whether his announcement came as a considerable surprise?

A.—I should say not altogether as a surprise. There had been talk of this scheme being put through, but only talk.

Q.—Had there ever been, as far as you know, any official summary of the scheme published before August 1923?

A.—Not to my knowledge.

Q.—The bill was read for the first time and then referred to a Select Committee?

A.—Yes.

Q.—Am I right in saying that the Select Committee passed the bill without any dissentients?

A.—I believe so, Sir.

Q.—And on the 29th September, it was read a second and a third time, and became law?

A.—Yes.

Q.—Now, you say in your statement, the statement of the Chamber, " it must be admitted that on Sir George Buchanan's original estimate of 367 lakhs published in September 1919, the scheme appeared an attractive one with land values standing at the level they did at that time ". What is meant by " published in September 1919 "? If it was a fact that it was made in 1919, the information must have been officially sent out. There is a little puzzle over the " September 1919 "?

A.—I shall have to refer to that.

Q.—Thank you. In fact, whilst the estimate was dated by Sir George Buchanan as September 1919, it appears to have been submitted to Government in October. That is a small point. What we should like to know is, what are the facts which made the Chamber say " published in September 1919 "?

A.—I think the wrong word must have been used, but I shall have to look that up.

Chairman.—The Development Directorate having come into being in November of 1920 following on the announcement of Sir George Lloyd on August 3rd, we know one of the first steps they took was to revise the estimate of 367 lakhs, which was, in fact, brought up to 702 lakhs. Was an Advisory Committee formed and was the Chamber given a seat upon it?

A.—Yes.

Q.—On that date when the Advisory Committee was formed, had land increased in value or decreased?

A.—I think there had been a fall in land values.

Q.—Can you tell us in those circumstances what was the attitude of the Chamber of Commerce?

A.—The Committee of that time was anxious to get more information. Even the increased estimates might not have disturbed their equanimity to a great extent but they were desirous of obtaining more information regarding the scheme.

Q.—Speaking of the Committee you mean the Advisory Committee?

A.—I am speaking of the Committee of the Chamber.

Q.—Did your representative on the Advisory Committee endeavour to obtain more information?

A.—Yes, he did.

Q.—Do you know if he succeeded?

A.—No, he did not succeed.

Q.—Was any reason given as to why he should not be supplied with the information that the Chamber of Commerce wanted?

A.—He was informed that questions of policy could not be dealt with by the Advisory Committee.

Q.—But up till now all you have told me is that he wanted, on behalf of the Chamber of Commerce, more information?

A.—More information on the question of policy.

Q.—On the question as to whether the scheme should be undertaken or abandoned?

A.—As to the carrying out of the scheme under the estimate of 702 lakhs.

Q.—Is it the view of the Chamber of Commerce that the Government assumed that their method of carrying out the work and the cost, that they were going to incur, were matters of policy?

A.—I think the Committee at that time assumed that Government took that view.

Q.—Was Dr. Sukhia the representative of the Bombay Municipality on the Advisory Committee?

A.—I think he was.

Q.—Do you happen to remember as to whether on the 20th of June 1921 he suggested at a meeting of the Advisory Committee the following questions for consideration? " Should not the reclamation of the Back Bay Scheme be abandoned for the present or postponed for at least five years ".

A.—I am afraid I do not remember. I was not in Bombay at that time.

Q.—Who was the member of the Advisory Committee sent by the Chamber of Commerce?

A.—The member representing the Chamber at that time was Mr. East.

Q.—Are you aware that on the 25th June Sir Lawless Hepper explained that Dr. Sukhia's proposal was not a matter which could be discussed by the Advisory Committee?

A.—I have read that in the proceedings.

Q.—That rather pointed to the position, as you say the Government took up with regard to your representative, that matters of policy were not before the Advisory Committee?

A.—Yes.

Q.—Your Committee desire to emphasize certain points:—" (1) That the wholesome practice of consulting commercial opinion was departed from." Bombay is pre-eminently a commercial city in which are to be found men very highly skilled in commercial questions with an intimate knowledge of local conditions.

A.—Yes.

Chairman.—" (2) The scheme was launched and carried out behind a veil of official secrecy ". Can you just give the Committee one or two facts upon which the Chamber of Commerce came to that conclusion?

A.—One fact is that our representative on the Advisory Committee was not able to obtain information.

Chairman.—And the other thing already referred to by yourself is Sir George Curtis' lecture before the Royal Society of Arts in which he gave reasons for this secrecy. There are two other things which you have mentioned, one is that as far as you know, there was no official communiqué made as to the intention to carry out the scheme.

A.—Yes of course that is the main point of our complaint of official secrecy. As far as I know not only was the Chamber of Commerce not consulted but none of the other bodies of Bombay were consulted.

Q.—Have you ever known in your experience of Bombay any public schemes that have not been submitted to the various representative bodies?

A.—I cannot call any to my mind.

Q.—The third ground is that the Chamber has always been opposed to State control of works which can very properly be entrusted to private enterprise and the Committee of the Chamber thinks the reclamation could have been done better by private contractor than departmentally. Did your Committee, in coming to that conclusion, take into account the state of the world trade in 1919 and 1920, the fluctuation of prices, the rise in material, labour, transport, etc.?

A.—I think the Committee realise that but they also think that it would have been possible to obtain some reputable firm of contractors who could have carried out this scheme.

Q.—And if there was no firm of contractors who would tender for the scheme, might not that have been an indication to Government that it was dangerous to proceed with the scheme at that moment?

A.—One would think that it would be a warning post.

Q.—On the same date, that is 15th of July 1921, Sir George Curtis in his speech at the Royal Society of Arts said that the whole scheme had to be carried out departmentally as owing to great fluctuations in prices of machinery, materials and labour, it was impossible to let out a contract on satisfactory conditions. If that statement of Sir George Curtis is correct, you think that that should have been a warning post to Government to consider the position?

A.—I think so.

Q.—Dealing with the future, your Committee are of opinion that the work should be continued on blocks 1 and 8 and probably 2?

A.—Yes.

Q.—And as regards block 8, as soon as that is completed, the miliary are going to take it over?

A.—Yes.

Q.—Therefore money will be available immediately?

A.—Yes, a book entry.

Q.—A book entry but that represents the cost of work of 239 lakhs. Has not the land however been acquired by the Government of India?

A.—Yes.

Q.—The Government of India's acquiring the land will credit the Government of Bombay with whatever may be ultimately agreed upon as its price?

A.—Yes.

Q.—The Committee make no recommendation with regard to block 7. Was there any information before the Committee with regard to the depth of No. 7 and the depth of No. 2? Was not the possibility of leaving block No. 2 and commencing on block No. 7 considered by the Committee?

A.—I think not.

Q.—That may be because the reports have hitherto dealt with blocks 8, 1 and 2?

A.—Yes.

Q.—The reason for your recommendation that work should be continued on blocks 1 and 2 is that first of all you want to ascertain the cost of filling in blocks 1 and 2 and you will know where you stand as regards cost?

A.—Yes.

Q.—Subsequently when that land is reclaimed you will know where you stand as regards the sale of land?

A.—Yes of that land.

Q.—These two matters will be a guide as to whether the rest of the scheme should be completed either wholly or in part?

A.—Yes and when.

Q.—As regards block 2 as compared with block 7, it is in more readily saleable area?

A.—At the present time.

Q.—And is believed that it will produce a much higher price per square yard than block 7 will produce?

A.—I think it ought to.

Q.—Then the recommendation of your Committee is that the work should be proceeded with cautiously and that the experience of the previous season should guide the work of the subsequent seasons even to the extent of abandoning it?

A.—Yes, abandoning a part, if necessary.

Q.—Even to the extent of abandoning the incompleted parts?

A.—Yes, a temporary abandonment because I do not think Bombay would agree to see an unfinished project for ever at their doors.

Q.—A temporary total abandonment of the scheme as regards dredging would involve the disposal of the dredging plant?

A.—Yes, otherwise it would depreciate very greatly in value.

Q.—And therefore a temporary total abandonment might result in the filling of the remaining blocks having to be done by moorum?

A.—Yes.

Q.—As regards the necessity for open public places, play grounds, is it in the opinion of the Committee very desirable that provision should be made for more open spaces even if that puts upon the rates a certain additional burden?

A.—Yes, it is.

Sir M. Visvesvaraya.—The Chairman has already traversed most of the questions I wanted to ask. I only want a few more details.

You said that the scheme was considered by Lord Willingdon's Government. Have you any personal knowledge of such a fact?

A.—I did not say that.

Chairman.—In October Lord Willingdon telegraphed that the re-examination of the Bombay Back Bay Scheme was a matter of special urgency and asked the Government of India to choose and send out the best qualified man available. It was only re-examination.

Sir M. Visvesvaraya.—I only wanted to bring to notice the fact that the scheme is very old. It was being developed from the beginning of this century by the Public Works Department.

A.—Yes, I think so.

Sir M. Visvesvaraya.—An estimate was prepared by Messrs. Lowther and Kidd in 1912 and the scheme was launched in 1920. The conditions were fluctuating at the time and we now take a different view point because the value of land has fallen, the boom has disappeared and the scheme has been disappointing so far as its execution is concerned. You have stated that the scheme was launched in secrecy and that little opportunity was given for public discussion?

A.—Yes, that is true.

Q.—There was also actual opposition from the Indian Chamber?

A.—I am afraid I am not aware of that.

Q.—We want your opinion as a prominent businessman whether the Government had not adopted an unusual course in sanctioning the project under the conditions they did. Are you aware that the reformed Council was not consulted? The work was rushed through in spite of public opposition.

Chairman.—Was the work being rushed in spite of public opposition?

A.—I think there was none.

Q.—Can you mention any public opinion in favour of the scheme at that time?

A.—I do not remember any unofficial opposition.

Chairman.—It went through the select committee without opposition.

Sir M. Visvesvaraya.—It is a well known fact that the Port Trust was not consulted and the Royal Indian Marine was also not consulted. The dredger was ordered before the detailed estimate was sanctioned. I am only enumerating the points on record. Then again after the sanction of the Government of India and the Secretary of State was obtained for 4 crores, an estimate of 702 lakhs was put into action without consulting the Government of India or the Secretary of State. The original estimate of 4 crores which they sent up to the Secretary of State was not a detailed estimate and they did not specifically say so when they submitted that estimate.

A.—I am afraid I do not know that.

Sir M. Visvesvaraya.—These are the facts. You agree, as a prominent businessman, that the course taken was unusual?

A.—Yes, it was unusual?

Q.—What do you think was the reason for such an unusual course?

A.—I think the public was informed at the time that it was going to be a very good thing financially for the public.

Q.—You have stated that private contractors might have taken up the work?

A.—Yes.

Q.—The sea-wall might have been taken up by a private contractor. Would any firm of contractors take up the filling? You have to throw in material and wait for the measurements for a whole year.

A.—I am afraid you are getting rather out of my depths, Sir.

Q.—The Committee think that the reclamation should have been done better by private contractors than departmentally?

A.—That is the general opinion of the Committee, provided of course a reputable firm of contractors could have been obtained to carry out the work.

Q.—You say for the future that the Development Department might be wound up and the reclamation handed over to private enterprise?

A.—I think we merely say the Committee are of opinion that the possibility should be gone into. We are not of opinion that it should be done.

Q.—Have you considered that the usual course is to get the work done by the Public Works Department? Why should there be a departure from the usual course?

A.—I do not think we discussed that.

I may tell you that the scheme has been under consideration for about a quarter of a century in the Public Works Department before it was sanctioned by Government. Then Government took it up, ignored the Department and transferred it to a new Department which they created.

(*Chairman.*—Have the Public Works Department made any borings? If so, let us know by what method and where is the record and where the gentlemen are who made the borings.)

Q.—You say in one place Government are justified in spending a limited amount of public money on public places and play grounds?

A.—Yes.

Q.—That would not be a proper charge against the estimate? That will have to be defrayed from Municipal funds?

A.—Yes. I do not think the question of payment for the playgrounds was intended by that paragraph.

Q.—There will be no comparison between the costs incurred and the rents received?

A.—No.

Q.—It must be a charge on the Municipal funds?

A.—Probably yes.

Q.—I suppose you have read the correspondence about the Engineers and the relations of the Engineers with the Development Directorate?

A.—I have read some of the evidence that you have had before you.

Q.—If a dredger was ordered, is it not usual for the specifications to state clearly the capacity of the dredger?

A.—I should imagine so, Sir.

Q.—And you would also insist on conditions in the agreement for testing that capacity before taking over?

A.—That is the usual thing.

Q.—And also it is usual to make the final payment after the plant has worked for some time at site?

A.—That I cannot tell you. If I take over a vessel I pay after trial.

Q.—If the contract does not provide for such trials at site is it not an unusual procedure?

A.—I am afraid I have never carried out contracts for dredgers.

Q.—But a ship is similar to a dredger?

A.—But a ship is at site when she is in the water.

Q.—Have you any idea of the value of land in this neighbourhood now and potentially, between Marine Lines and the Colaba end? I understand rates vary between the places.

A.—I can give you only hearsay. I understand the Government are asking Rs. 200 per square yard at Queen's Road, that they have been offered Rs. 90, and I understand that the values in Colaba, such as the Cotton Green are somewhere between Rs. 40 or Rs. 50 per square yard. That is only hearsay.

Q.—There is a provision in the estimate of about 147 lakhs for roads, lighting and drainage for the whole area. Do you not think it is desirable to carry out those roads and drains as buildings spring up, and not to have the whole thing done at once?

A.—I am not an engineer, Sir, but I understand it is cheaper to put drains down when you are constructing an area than to do so afterwards.

Q.—Storm water drains are being put in now, but underground drains may be postponed till buildings begin to spring up?

A.—I am afraid I am not sufficiently an engineer to tell you.

Q.—What public bodies are likely to require land in that area in future? St. George's Hospital may require a new site I understand.

A.—No doubt there are a number of institutions, Government and otherwise that require extensions now, hospitals, schools, etc.

Q.—So there is demand for a certain amount of accommodation immediately?

A.—Oh yes.

Q.—You are aware that there are 8 blocks to be filled and Nos. 1 and 8 have to be done in any case.

A.—We think so.

Q.—Probably they have practically decided about it. When these two are completed, they will be 4 crores to the bad, that is what the Development Director told us. Now taking that as the starting point, if they proceed with Nos. 2 and 7, the cost of reclaiming may come to 70 lakhs and the area reclaimed to 10 lakhs of square yards. At what rate would you put it for the purpose of an estimate?

A.—I should not take more than Rs. 25 per square yard.

Q.—That would make 250 lakhs. If you spend 70 lakhs and are likely to get 250 lakhs, would you not go on with the project?

A.—I think it would be a reasonable proposition.

Q.—And supposing thereafter you have 27 lakhs of square yards to reclaim and it would cost 214 lakhs to do it would you proceed with the work or not?

A.—If I could sell it at Rs. 20 per square yard, I would.

Q.—Could you sell it?

A.—I am afraid it is looking forward so far into the future, Sir, I am not prepared to prophesy.

Q.—Taking the condition of Bombay generally, supposing you have to come to a decision as to whether it is desirable to acquire land at Rs. 7 per square yard with the prospect of getting Rs. 25 for it, would you go in for such a scheme or not? Would you approve of such a scheme or would you leave things incomplete?

A.—If I could reclaim at Rs. 7 per square yard with the prospect of selling at Rs. 20 or 25 I would undertake it.

Sir Frederick Hopkinson.—Prosecution of this scheme should largely be based upon commercial considerations inasmuch, if it is estimated to cost 367 lakhs and is done for that sum and can be sold for 367 lakhs, the Government is getting that area of land for nothing and therefore it would be a wise thing to do?

A.—Yes.

Q.—Before you realise whether it is wise to prosecute the scheme if it is going to cost 702 lakhs, and if you find it would cost 11 crores, the mere mention of such a sum might have stopped the scheme in its inception?

A.—Yes.

Q.—A wise scheme at 307 lakhs would be a ruinous one if it were going to cost 11 crores?

A.—Probably.

Q.—Do you mean in this paragraph 3 of your conclusions that the construction of the work should be done by private contractors? Had the Government in 1919 tried to get tenders from private contractors the price quoted might have been so high as to put the scheme out of action?

A.—Yes.

Q.—Can you give us any particular reason why the Government should not have asked for tenders?

A.—To the best of my recollection I think there was difficulty in getting contractors to quote at that time, for what reason I cannot say.

Q.—Did they actually try?

A.—I cannot say how hard Government tried.

Q.—Did they actually try at all?

A.—I do not know.

Q.—Generally speaking your Committee thinks that the Government should only carry out departmentally as a last resort?

A.—Yes.

Q.—After having done their best to find out if any contractor would carry out the work?

A.—Yes.

Q.—You have been here the whole time the works have been going on. Can you give me any idea as to whether you think the carrying on of this work departmentally is being better done than if a capable contractor had been employed?

A.—It is my own opinion that a capable contractor would have carried out the work quicker and better than it has been done.

Q.—That is your considered opinion after having seen the work in progress for 3 or 4 years?

A.—Yes.

Q.—If block 7 were completed within the next two years, is there much likelihood of being able to sell that land for building purposes?

A.—It would be a very good area for building purposes for residential quarters.

Q.—So that if that block 7 can be economically constructed, you think it will soon produce results in the way of sales?

A.—I think it ought to, Sir.

Q.—Would it sell as readily as block 1 for residential purposes?

A.—I think so, because you would not expect so much return from block 7 as you would from block 1, I mean per square yard.

Q.—It would be less valuable per square yard?

A.—Yes.

Q.—In all the plans I have seen block 1 appears to be mainly occupied by pleasure grounds, and therefore when that is completed it would produce no tangible results in the way of revenue.

A.—If the original scheme is carried out, that is so. It would be a very large area to give up to recreation grounds altogether.

Q.—Do you think a portion of it at any rate could be sold for residential or office purposes?

A.—Yes.

Q.—I take it the office purposes would be the more remunerative of the two. You will get higher prices.

A.—That is a little difficult to say.

Q.—Supposing this Committee advises the Government to stop all works and abandon the whole scheme, can you give me any indication of what the population of Bombay would think about it?

A.—I think those of the public that have any ideas on the subject at all would be very disgusted, and for years it would be an eye-sore, which I do not think the inhabitants of Bombay would intend should continue to exist.

Q.—It would be a reproach to Bombay?

Q.—The public of Bombay would resent that very much indeed? Almost as much as the cost which they have to bear, but not quite so much.

A.—Not quite so much.

Q.—You think the public of Bombay would prefer to finish the scheme and bear the cost rather than abandon it in the present state?

A.—I am not prepared to go so far. There is very considerable public opinion against completing the scheme in its entirety at once.

Q.—There is strong public opinion in favour of completing it at some time?

A.—I think there is public opinion that it should be completed.

Q.—Not within the next few years?

A.—No, it would run into many years.

Mr. Billimoria.—Sir Leslie, you have told us that you have been in Bombay for several years. As the head of a very large shipping interest in India and connected with the Bombay Chamber of Commerce you must have come in contact with several business men?

A.—Yes.

Q.—In your note you have recommended a private agency undertaking such a huge work?

A.—Yes.

Q.—Are you aware of the fact that a powerful syndicate had approached Government for some concessions before the scheme was launched in December 1917?

A.—Except the common knowledge that was going round, I have no details at all. I have no knowledge concerning the syndicate or who they consisted of or anything like that.

Q.—Do you know the reasons why the then Government of Bombay refused to grant such concessions? I may tell you the reasons were the Government would have no control over a private syndicate or a private company, that the prices of land would be inflated and that the people of Bombay would never get the benefits it was proposed and intended to give. Don't you think there was something in this argument as advanced by Government then?

A.—I do, Sir.

Q.—This is in answer to the question that you have raised in the note that you could have preferred a private firm undertaking this huge business rather than the State.

A.—I think my statement is intended to convey that we preferred that the work should be undertaken by a contractor rather than by Government. We might not object to a contractor working for Government, provided the terms were reasonable.

Q.—Would you give the contract to different contractors for different jobs? Is that the idea you want to convey?

A.—I had not considered that. We merely considered generally that private agency was preferable to State agency.

Q.—If Government had given contracts to some private individuals, as they will, as a whole or in parts, would not Government have been accused of favouring, of patronising a particular contractor?

A.—It has been done. Such accusations have been made.

Q.—Could one firm of contractors have undertaken such a huge contract?

A.—I think there are contractors to be found who would undertake the whole thing.

Q.—You mean here in India or out of India?

A.—I should say out of India.

Q.—If you say out of India, may I remind you of the advertisement that appeared at the time of the flotation of the loan in connection with the Back Bay Scheme when the

4 crores was wanted by Government it was said every rupee thereof would be utilised in Bombay for Bombay and by Bombay, and if these contracts were given over to an outside agency, that would have invited very rigorous criticisms from the public press?

A.—Yes, probably there would have been criticism on that point, but if the dredger had been purchased through a Bombay firm, money would have been spent in Bombay, would it not?

Q.—Supposing this business had been handed over to some responsible firm of contractors, what would have been the position of that contractor or syndicate to-day? He would have found himself in bankruptcy?

(*Chairman.*—You must not assume that a contractor would have carried out this work in any way in which it has been carried by Government.)

Q.—Do you think any contractor in his senses would have taken on this work with the information before him on 367 lakhs?

A.—Certainly not.

Mr. Billimoria.—Do you think Government were wise in launching on a scheme like this based on a calculation of 367 lakhs without careful enquiry? If a contractor could have been found, was it wise for Government to have undertaken it?

A.—Probably not. Government had estimates to go on, and that is where the contractor would have come in: the one estimate would check the other.

Q.—With regard to the first paragraph of your statement, Sir Leslie, you have referred to the crowded insanitary condition of the dwelling places of the labouring classes in Bombay. By the improvement in the north of the island, the development of which was undertaken by Government, are not conditions improved there?

A.—They have, certainly.

Q.—Do you think then that there was an urgent necessity for an immediate undertaking of the reclamation?

A.—Not for that class of persons.

Q.—Are there any other classes for whom there is an urgent and immediate necessity?

A.—There is an urgent and immediate necessity for middle class dwellings.

Q.—Provided they could be got cheaper?

A.—Exactly.

Q.—Not at the price of Rs. 90 a square yard? You do not expect the middle classes to go and live in such places?

A.—No.

Q.—As to the latter part of the statement where you say that the reclamation was to provide open spaces for buildings, residences and offices the accommodation for which was to be considered and so on, do you think that such a large area as 1,145 acres was required to be reclaimed for this purpose?

A.—It is more a question of the configuration of the coast line than the amount of land required.

Q.—Do you then mean that there was a necessity of taking into account the recreation ground and the building site that was necessary so that such a huge area was required as 1,145 acres of land?

A.—Probably so large an area of land was not required at that time. But at that time, looking to the future, it might have been considered probable that that area would in a certain term of years be required, taking a long view.

Q.—You will agree with me that, if this object was achieved at a cost of Rs. 6 or 7 per square yard as was estimated, that would have been a blessing to Bombay?

A.—Yes, that would.

Q.—Don't you think then that if the Government in embarking on the scheme based all its calculations on such estimates and figures before them, and if these estimates have gone hopelessly wrong, whom would you consider responsible?

A.—Is it not for the Committee to decide, Sir (addressing the Chairman)?

The Chairman.—That is a question which we have to decide. You will perhaps not put that question (addressing Mr. Billimoria). It is one of the things which we have to decide and it involves a very very long consideration and one ought not to ask a witness a question which we have got to settle—we have got to get the facts and we have to decide it.

Mr. Billimoria.—Turning to page 2 of your notes at the end you say that "The Chamber wanted detailed information and it was denied on grounds of policy". Can you tell us who refused to give you this information? Government is a very wide term to use. By Government do you mean the Secretary or the Director of Development or any responsible officer of Government?

A.—The Advisory Committee was presided over, I understand, by the Director.

Q.—Did he decline to give you the information?

A.—Our representative informed us that he was unable to obtain the information at the meeting of the Committee.

Q.—Do you concede that it was the proper attitude to take in view of the fact that the original estimate of 367 lakhs had risen to 702 lakhs by then?

A.—I think the attitude of the Chamber of Commerce is represented in my statement.

Q.—In your speech in the Legislative Council you have expressed that, if there was greater candour, it would have inspired greater confidence?

A.—Yes, I said that in the Council.

Q.—What impression did the annual Administration Reports give you? Were you led to believe that all was well?

A.—The impression was that it was going on reasonably well.

Q.—It was last year that the Advisory Committee's report was out and it was then for the first time that true facts came to light. Is it what you mean?

A.—Yes.

Q.—You refer in your notes to some sinister rumours. What were they?

A.—That was prior to the circulation of the report of the Advisory Committee. There were sinister rumours as to the output of the dredger.

Q.—Do you seriously condemn the policy of the Government in not consulting commercial opinion before the scheme was launched? This is one of the grievances that you have raised in those three paragraphs 1, 2 and 3 of the statement? I want your opinion as a representative of the Chamber.

A.—I cannot take those words into my mouth exactly, Mr. Billimoria, but the Chamber's opinions are represented by these particular headings here.

Q.—Do you object to the veil of official secrecy, even if Government had reasons for such secrecy?

A.—In spite of that I think that Government should have been considerably more candid than they were. I have expressed that already in the Council.

Q.—You still strongly feel that the reclamation could have been better done by private contractors than departmentally?

A.—The Committee are of that opinion.

Q.—What special reasons have you for this conclusion?

A.—The Committee are of the opinion that in all big works of this sort contractors who have years of experience behind them and who have the staff at their disposal who have done works of a similar nature in other quarters of the globe would naturally be better able to carry out a work of this sort, than having to create your own staff as was the case in this instance.

Q.—That does not mean that the department is inefficient or negligent?

A.—I do not want to make any accusation against anybody.

Q.—Now for the future programme do you recommend that blocks 1, 2 and 8 should be completed? There is nothing regarding block 8. Would you complete block 2 now or await the result of block 1. As a prudent business man, would you go headlong or would you wait?

A.—My Committee would like to know the result of the dredging for last year. We should then be better able to come to a conclusion.

Q.—Do you think that if it be placed in the market there would be an immediate demand for it?

A.—There cannot be an immediate demand for the whole of it.

Q.—My friend, Sir M. Visweswarayya referred you to the point that some of the land is required for public purposes, and you stated that they were for schools, hospitals, Government buildings and so on. Apart from that, do you think it would be taken up for public purposes and the rest would go for private residences or offices?

A.—Yes.

Q.—I take it that you know the land now known as the military area. Do you think that that land, when put in the market, is likely to compete with the reclamation area? We are just completing block No. 1, would not that directly compete with this land, if placed on the market?

A.—I have not seen any amended programme of Government as to how they are going to deal with this reclaimed land. Presumably they have some other plans than those originally formulated.

Q.—You would not hazard an opinion before knowing all the details?

A.—I must know all the details first.

Q.—Do you think that it is likely that Government might realise Rs. 200 a square yard for the military area between the Marine Lines and Church Gate?

A.—Not at the present time.

Q.—How long do you think until the conditions of Bombay are healthy and prosperous?

A.—If you can tell me when trade will improve.

Q.—You ought to know better, you are acquainted more with the condition of the commerce of Bombay?

A.—But you examine the balance sheets.

Q.—You do not think in the present depression of the market conditions that there would be a demand approaching Rs. 200 per square yard?

A.—I do not think at the present moment.

Q.—If on the reclaimed area the site is sold to the public and buildings three and four stories high are put up, do you not think it would ruin the new Marine Lines just behind the military area where some new bungalows have been built? Don't you think those properties would be ruined being deprived of the open sea breeze?

A.—You are putting me questions that you ought to ask an architect.

Q.—Suppose you put up four-storied buildings in the military area and the reclaimed land, then the property on the new Marine Lines will naturally become of much less value?

A.—They would reduce in value, certainly.

Q.—I take it that you are not in favour of completing the whole reclamation immediately. Would you advise to go slowly and carefully after watching the results of blocks 1 and 2?

A.—Certainly.

Q.—You were also asked something by Sir Frederic Hopkinson about block No. 7. Suppose that is taken simultaneously in hand now. Then if that area were thrown on the market and if people with moderate means were prepared to pay Rs. 20 per square yard to buy that land, they would in a measure reduce the price of the blocks. Has your Committee considered that?

A.—I do not think that the Committee has considered that.

Q.—Do you concede that the site of block No. 1 is suitable for business purposes?

A.—In No. 1—No.

Sir Frederick Hopkinson.—It would be valuable for private houses?

A.—Private houses, hotels or residential buildings.

Mr. Billimoria.—There was a question asked you with regard to the winding up of the Development Department. Would you prefer the department's activities being transferred to the Public Works Department, or the department being abolished altogether?

A.—The Committee stated that they are of the opinion that the possibility of handing the work over to private enterprise should be gone into. They are not prepared to give any definite opinion on that. It is merely a suggestion.

Q.—Would you do that before blocks 1 and 8 are completed or immediately?

A.—I think you must carry on blocks 1 and 8 forthwith.

Q.—In the concluding paragraphs you have referred to public places and play-grounds. How much area would you reserve for open spaces and play-grounds in blocks 1 and 2?

A.—You are asking my private opinion? As such I fear it would not be worth putting on paper.

Q.—I may point out that the cost of reclamation has gone so high that to provide a very large area for recreation grounds would in a very great measure curtail the resources of Government. We have to make this land as poductive as possible and to cut down the losses. We have to face losses no doubt, but we want to curtail it as far as possible. With this view if that area is curtailed, do you think there will be public clamour over it? I mean the area for the recreation ground?

A.—I think that in laying out any large reclamation scheme of this sort you must have your lungs for the people who are going to live in it.

Q.—You remember, Sir Leslie, that the Legislative Council wanted an enquiry. Have you anything in particular to bring to the notice of this Committee or direct the Committee's attention to any matter of enquiry?

A.—The Council was very keen that the matter should be enquired into. I have nothing formulated to put before this Committee.

Q.—Have you anything more to add to your speech in the Council made in last March?

A.—I think I have nothing else, Mr. Billimoria.

Q.—I have to ask you one or two questions arising out of the examination by my friends here. I think it was in answer to the Chairman that you said something about big interest. The tax-payer is concerned in it so far as relates to the saving of his tax. Don't you think it is usual to take the item of interest into consideration? You save your interest by the tranfer of this area, do you not?

A.—Yes.

Q.—Don't you think in every commercial enterprise interest forms a principal basis of calculation?

A.—Certainly.

Q.—And the longer the period before which your scheme proves productive or profitable the more you lose because the interest goes piling up?

A.—Yes.

Q.—Have you any idea as to how long it would take to complete block No. 7? Have the Committee at all considered this?

A.—They have not.

Chairman.—You have been questioned about the information that your representative on the Advisory Committee furnished to the Chamber of Commerce. The Committee were informed by the Director that questions relating to the general policy of Government could not suitably be discussed. Is there any record on the minutes of any meeting or any statement made by Mr. East to the Chamber?

A.—There is nothing to be found on the minutes of any meeting of the Chamber, Sir.

Q.—On what facts is the information in the statement based?

A.—Our representative reported to us in writing.

Q.—Have you got that document?

A.—I am afraid I have not got that with me.

Q.—Can you let us have the report of Mr. East in which he complained that he was not given the information for which he was asking?

A.—Yes, that can be given.

Q.—Some time to-day?

A.—Yes.

Q.—Will you send it to Mr. Ewbank?

A.—Yes.

Chairman.—You have also been asked about the question of the possibility of winding up the Development Department. That is not a matter within the terms of our reference, but the possibility of advising Government to hand over this particular work to private enterprise no doubt is. The Development Department have many activities besides reclamation, and when you use the phrase "the possibility of winding up the Development Department", I think you are merely referring to the reclamation?

A.—That was the intention.

Q.—It would hardly be the winding up of the Development Department. They have got so many other things to do.

A.—Yes.

Q.—You put forward the suggestion that at some time or other it is essential that this scheme must be carried out in its entirety and your view is that those people in Bombay who think about it at all would be of that opinion?

A.—Yes.

Q.—But the actual cost must be paid by people who live in an area much wider than the Bombay city?

A.—Yes.

Q.—What do you think would be the opinion of the people in the mofussil about it?

A.—They would probably not be so enthusiastic about the completion as the Bombay residents themselves. They might indeed take the view that if the Bombay city wants the removal of the eye sore, the Bombay city should pay for it.

Q.—Would there be any difficulty if the Government of Bombay should publish Mr. Kidd's report and Sir George Buchanan's report to the world?

A.—I imagine no difficulty at all.

Chairman.—And could they have invited contractors to tender on the basis of those two documents?

A.—I think they possibly could.

Q.—It would then have been for the contractors to consider whether any prudent contractor would tender on such documents?

A.—Yes.

Q.—And whether it was worth while to come to Bombay to spend money in order to give their prices for the work?

A.—Yes.

Q.—And the contractor will spend 5 or even 15 thousand pounds in preliminary investigations, will he not?

A.—I think so at least.

Q.—The risk is on him to give the price at which he will complete the contract?

A.—Yes.

Q.—Usually under a bond?

A.—Yes.

Q.—And therefore the contractor, as part of his necessary business expenditure, has frequently to incur large sums in investigating the work which is offered to the world?

A.—He must do if he is a wise man.

Q.—He must, if he carries on his business properly?

A.—Yes.

Q.—Now if the information conveyed in Kidd's report and Buchanan's report had been sent out to the world with an invitation to contractors to tender, and if nobody had come forward ought that not to have made the Government of Bombay pause?

A.—Yes, they should have realised there must be some very good reasons for contractors not quoting.

Q.—And if one, two or three contractors had come forward and had given the price, then it would be the duty of the Government to consider whether any one of these should have been accepted?

A.—Yes.

Q.—And if they came to the conclusion that there were reasons for preferring one particular contract, they could have made those reasons public?

A.—Yes.

Q.—Whether they would be accused, as my friend Mr. Billimoria said, of favouring one particular contractor or not, if the Government had duly put all the facts before the public, that criticism should not matter in the slightest degree?

A.—No.

Mr. Billimoria.—What I said was that if we had invited criticism of such a nature, Government would not be accused of patronising particular contractors?

A.—Yes.

Q.—If Government set out the tenders put forward by all the contractors and gave reasons for accepting a particular contract, probably it should not matter to the Government whether they were criticised or not?

A.—It should not matter to them at all.

Q.—And that was the type of procedure which the Committee had in their minds when they were suggesting that it was work which might have been undertaken by private agency?

A.—That it should have been put out to tenders.

Q.—My friend Sir Visvesvaraya spoke about the contract: As regards the dredger, you know the terms of that contract well, but the point he is making—it is an important point—is that the contract stipulated for the delivery of the dredger on the Clyde?

A.—Yes.

Q.—Your point (addressing Sir Visvesvaraya) is that if it was carefully drawn up it would have stipulated for delivery at Bombay. Would a stipulation to that effect, not that the delivery should be made on the Clyde, but that the delivery should be made at Bombay and the trials carried out at Bombay, make a material difference to the view of a dredger builder on the Clyde?

A.—I think it would be very difficult to get a builder to quote you on those terms.

Sir Frederick Hopkinson.—Government would have put in the contract that they should be ready to make those trials when it arrived.

Sir M. Visvesvaraya.—A certain time is usually allowed; they might expect the final payment six months after the dredger had arrived in the harbour. That is the practice. If that is so, then the Government should have stipulated for such a condition even if it had cost more to do it?

A.—Yes.

The Chairman.—The question is if Messrs. Symons or any other dredger builder had given the price for a dredger which had to be brought out to India and passed through tests in India, if he had given the price, would it be a reasonable proposition?

A.—They would not give any prices at all at that time or any other time. The Port Trust have purchased a number of dredgers on various occasions and the terms of their contract may be easily obtained for verification.

Q.—By looking at the report of Sir George Buchanan at page 17, what Symons and Company offered to do was to deliver the dredger on the Clyde, which would satisfy certain tests and nothing else?

A.—Yes.

Q.—And the record of those trials are contained in the correspondence with Messrs. Meik and Buchanan regarding the execution of the works, on pages 30 to 38.

Sir M. Visvesvaraya.—My point is whether it is sufficiently safe for the Government to enter into such a contract that the tests should be made on the Clyde and the Government should take the chances after the dredger arrives in Bombay.

Sir Frederick Hopkinson.—What would happen is this. If you stipulate for a fancy dredger six thousand miles away from Bombay, the dredger owners would have given you a fancy price for making that dredger.

Sir M. Visvesvaraya.—It is a gamble to a certain extent, as it has proved actually.

A.—I think we have to conform to the usual custom, Sir Visvesvaraya.

Sir M. Visvesvaraya.—But we get out engines, and payment is made after trial. We test them before paying the final instalment, in a contract. Is not that the usual practice?

A.—I believe that is the practice in some cases. The case of an engine is rather a different thing from that of a large dredger. Pumps can be returned, but dredgers could not.

Q.—Anyhow Government was taking a great risk by not stipulating for a trial here?

A.—I am afraid I cannot give you an answer on that point.

The witness withdrew, and the Committee rose for lunch.

(The Committee re-assembled at 3 p.m. on the 12th August 1926.)

10th Witness

Captain F. B. Phillips (R.I.M.)

Chairman.—Captain Phillips, what is your full name?

A.—Engineer-Captain Frederick Brown Phillips.

Q.—How long have you been in association with the "Colaba"?

A.—From November 1925.

Q.—What condition did you find her in in November 1925?

A.—I have a copy of my report. May I read it?—"The vessel was seen under normal working conditions. Vibration is particularly noticeable when approaching the vessel, the forward funnel showing extensive movement Fore and Aft. There are 4 Boilers in Pairs, at Fore end and Aft end of Boiler room on which there is considerable Fore and Aft movement, the Fore pair moving in opposite direction to the after pair. The arrangement of steam piping provides for considerable expansion. Although there is no immediate danger it must be recognised that the contraction and expansion of the steam pipes due to the movements of the boilers is becoming excessive and a risk of fractured steam pipes exists. The Machinery consists of one set of triple expansion engines coupled up to, and driving the centrifugal pump. There is considerable movement on the engine especially at the Fore end (H. P. Cylinder).

Examination of the engine seating and bed plate showed that a number of rivets securing angle brackets have worked loose which permits considerable vertical movement of the engine. This is, I consider, a serious defect which can develop to a dangerous extent, due to the excessive vibration which is set up.

The holding down bolts of the engine bed plate cannot be kept secure under present conditions and are liable to fracture.

There is no immediate danger, providing a strict watch is maintained to ensure that the defects reported do not extend. I further recommend that should the ship's staff find that the movement of the H. P. engine is increasing under working condition—the fact should be reported and the engine stopped.

The vibration of this vessel is not entirely due to structural weakness and there is no doubt that it is aggravated by the defects of the Main Engine seating. Although it is not possible to eliminate vibration in a vessel of this type it is possible to reduce it.

The boilers and their steam pipes and connections are being severely tested and it is only due to the arrangement of steam pipes which permit of considerable movement that an accident has not already taken place. "

Q.—What is the date of that report?

A.—7th November 1925.

Q.—Did you afterwards have a consultation with Mr. Brims, the Deputy Chief Engineer?

A.—Yes.

Q.—Can you tell me when? It may have been on the 6th of November.

Q.—What was decided to be done?

A.—We decided to proceed with the stiffening Fore and Aft between the boilers. I have a plan.....

Q.—When did she go into dock for that work to be done?

A.—I cannot give the exact date, but I can give the date when we completed the work. It was supposed to have been completed on the March 13th, 1926.

Sir Frederick Hopkinson.—How long was she in dock?

A.—I think she was in dock for about a month. I am sorry I cannot give the date, ... roughly about a month.

Q.—About a month? Therefore she lost part of the ordinary working season by going into dock?

A.—She lost the time that she was in dock. I don't know on what date the engine of the " Colaba " was stopped.

Q.—At all events she was in dock from about February. She was losing the whole of February to March, March to April, and April to May. Therefore, she was losing some 90 days.

A.—I cannot speak of 3 months. I can only speak of the time she was in dockyard.

Q.—You say, she was not under ordinary working conditions until at least May 16th?

A.—Exactly so.

Q.—If she went into dock on February 16th, she lost one month from February to March, and two months from March to May. Do you know what happened to her after she came out?

A.—No, Sir. I cannot answer that. After she leaves the dockyard, we have no concern with it.

Q.—Do you know what was the cost of the stiffening?

A.—No, Sir. I can give these figures, but I have not got them here.

Q.—Would you send them to Secretary, Mr. Ewbank?

A.—Yes.

Chairman.—The total cost of the work including, of course, dockyard charges for the work of repairs done in February and onwards.

Q.—When did you see her again?

A.—On the 12th of May 1926.

Q.—What condition was she in then?

A.—May I read a report on that, Sir?

Q.—What work did she do?

A.—I cannot tell you that.

Q.—When did she finish other repairs?

A.—11th of May. I wrote a report in conjunction with the Chief Constructor of the Dockyard. The report is as follows. Captain Phillips read the report from a file he had with him.

Q.—When was it dated?

A.—That was dated 18th of May 1926.

Q.—We have not got that.

A.—I will send you a copy.

Chairman.—With regard to the cost of the " Colaba " it appears that the cost was Rs. 25,000. It is on page 22 of " Correspondence and Notes regarding the Responsibility of Messrs. Wm. Simons & Co., Messrs. Sir John Biles & Co., and Sir George Buchanan in connection with the stiffening of the Intermediate Pumping Station, ' Colaba '." The cost of stiffening the intermediate pumping station " Colaba " has amounted to Rs. 25,000.

A.—I cannot tell you whether it is our dockyard estimate. Possibly the " Colaba " was stiffened before.

Q.—It looks as if that is the dockyard figure?

A.—I am not certain about it. She may have had some stiffening before she came into dockyard hands.

Q.—Was that the running of 2 girders along the upper structure?
A.—I think cross girders.

Q.—We were told yesterday that all that material had been supplied by the makers and that all the cost that was incurred in relation to it was labour?
A.—It was, labour.

Q.—Then the stiffening that was done in the dockyard was not altogether of different character?
A.—Labour and material.

Q.—Having got in some time in February, we find this note on the 10th April 1926 that the cost has amounted to Rs. 25,000. Will you however send us the exact estimate that the dockyard made?
A.—Yes, Sir.

Q.—You now read to us your report of the the 12th of May?
A.—No, 18th of May.

Q.—What was done with regard to the "Colaba" then?
A.—As far as I know, the "Colaba" stopped working and we received a letter—I don't know whether I have the letter here, we must have it in my office file—asking the Dockyard to carry out repairs. It was somewhere in the middle of July.

Q.—*Last month*?
A.—Yes, last month.

Sir Frederick Hopkinson.—Was that at the same time when the "Sir George Lloyd" was said to be working well?
A.—That I cannot say. I think they shortened up the pipe lines, as far as I remember.

Chairman.—Have the Dockyard authorities undertaken the repairs?
A.—No, unfortunately we are too busy.

Q.—Where is she now being repaired?
A.—Mazgaon Dock—I am not certain about that.

Q.—Is there any other matter in which you can assist us?
A.—I don't think there is anything else that I can say about the "Colaba". I think if the engine seating is properly repaired, it would work well. She is a well-built ship. There is no question of its being lightly built. You cannot always legislate for vibration or anything that is going to happen under working conditions.

Sir Frederick Hopkinson.—The Suction Dredger is well known?
A.—It is well known.

Q.—It is larger?
A.—I have never had any experience of a Suction Dredger.

Q.—You say, she is well-built?
A.—Certainly, it is only under working conditions that you can find out the defects.

Chairman.—But surely, a maker of experience who is designing a vessel like the "Colaba" which was only a booster ought to know exactly the stresses for which that vessel would be built. It has got to include the stress that will be required to deal with pipes 42" in diameter and the energy required to propel the material between those pipes 5,000 feet. That is the only problem?
A.—Yes. That is the only problem.

Q.—It was to receive from the pump of the "Sir George Lloyd" 5,000 feet of material which it had to boost on to another 5,000 feet, and the strain to which that vessel should be subject ought to be known to a maker of repute and experience"?
A.—The strain is due to vibration and nothing else. It is not due to structural weakness,

Q.—But the vibration is due to the output of power of the engines?
A.—Exactly.

Q.—Are those the factors which a firm like Messrs. Simons & Co. ought to know thoroughly?
A.—Yes, Sir.

Q.—What is your exact position, Captain Phillips?
A.—I am Engineer-Captain and Engineer-Manager of the Government Dockyard.

Q.—What is your training?
A.—I had been trained in the Government Dockyard in England. I belong to the Royal Indian Marine. I commenced my career in the Royal Indian Marine in 1902 and since then I had been in the Government Dockyard. I am a qualified Engineer and Ship Surveyor. During 1919/1923 I was principal Engineer and Ship Surveyor to the Government of Bombay.

Q.—That movement about which you spoke in the main pump, do you look upon it as a serious matter?
A.—Yes.

Q.—Unless cured it would have very serious consequences?
A.—Yes, Sir.

Q.—What do you think that vibration is caused by?
A.—My personal opinion is that the pumping engine should have been amidships in the centre of fore and aft displacement.

Q.—You say say that the movements of the funnels could be seen a hundred yards off inclining 6 or 7 inches and there was a movement between the boilers of an inch or so?
A.—That is in my report, Sir.

Sir Frederick Hopkinson.—You have not given dimensions?
A.—No.

Chairman.—You indicated on the plan the stiffening as shown in red and you say that the movements of the engines after that stiffening was up and down. There is a movement of the engine seating and its fastenings?
A.—Yes, we cannot get out of that.

Sir M. Visvesvaraya.—Is that a plan showing the outlet pipe?
A.—Yes.

Sir Frederick Hopkinson.—There is weakness in the hull?
A.—I cannot say it is weakness.

Q.—The hull should be strong enough?
A.—It ought to be.

Q.—There was no damage to the hull and therefore it is not due to weakness?
A.—Yes. There was no damage to the hull.

Q.—I think you said you were not doing the present work and so you cannot give any idea of the cost?
A.—I can give you an idea of the estimated cost. That was communicated to the Deputy Chief Engineer, Dredging Section.

Q.—This is a seagoing craft with, I think, twin screw engines. Don't you think a strong floating square pontoon would be a more suitable means of carrying on with pumping?
A.—Equally suitable.

Q.—What are the propellers required for? Do you think it necessary in the sea-going boat to have twin screw engines with square strong pontoon? Would it answer as well or better?
A.—I think it would answer as well if not better

Sir Frederick Hopkinson.—Do you think it necessary to have a sea-going boat with twin screw engines for the purpose of carrying a pump only.
A.—It is certainly not essential.

Q.—Would a secured strong pontoon be sufficient?
A.—Yes.

Q.—There is no point really in having a sea-going boat because it is only for the purpose of getting it there, *i.e.*, to its pumping site?
A.—Yes.

Q.—Had the pontoon not been put together but sent out in parts; could it have been erected here?
A.—Yes.

Q.—There is no difficulty in erecting such pontoons here?
A.—No. We would have done it readily.

Q.—Do the engines of "Sir George Lloyd" vibrate in the same way?
A.—I have no experience, I have not seen it.

Q.—You have not been asked to consider that?
A.—No.

Q.—Do you know when the vibrations were first noticed?
A.—We had first information about it when we went on board on the 7th November, 1925.

Q.— The "Colaba" had been working 2 seasons then and this was the third?
A.—I believe it had been noticed before that and a certain amount of stiffening had been taken in hand.

Q.—On the second of November 1925, the Chief Engineer reports that the longitudinal bracing and stiffening supplied by Messrs. Simons & Co. was fixed during the monsoon season but has not been effective in stopping the vibration. That would have been fixed after the second season of working?
A.—Yes.

Q.—This was the first repair which you had in your mind when you said that she had some stiffening before?

A.—Yes.

Q.—Have you seen the " Colaba " working?

A.—Yes, on two occasions.

Q.—The Chief Engineer states ' that the vibration was at its worst when the engines were running at about half speed before picking up load.' What do you think about it?

A.—It is quite possible.

Q.—It is rather like sea-going engines racing?

A.—Yes.

Q.—But of course we know that vibration is pretty bad?

A.—Yes.

Q.—Was that to be expected?

A.—You can never tell when an engine will stop vibration. When it comes to a certain point vibration stops altogether and probably starts when it reaches higher revolutions.

Q.—Then he goes on to say " since that bracing has been fixed there has been so far very little vibration until the engines reach their full speed at or about high water ". Surely they are running at full speed?

A.—They are expected to run fast or slow. I do not know the standard revolutions.

Q.—And about high water " when the engines reach their full speed their vibration is excessive the two ends and centre of the ship moving up and down to a very appreciable extent and nothing more so than last season ". They had done very small repairs before this, but this is referring to what you have done now.

A.—Yes, this refers to the first repairs.

Q.—He goes on to say " at low water when the vessel has a heavier load to contend with there is very little vibration ".

A.—That is true.

Q.—Can you explain this?

A.—I cannot explain why it should be with any load at all if the engine is properly balanced and governed. There should be no vibration any more than it would be when there is full load on it.

Q.—I presume that as a consequence of this report on the 2nd November 1925 suggesting that an experienced and qualified naval architect or constructor should be called in, you were asked to inspect the ship with the Chief Constructor of the Dockyard so that, at any rate, the vessel had the best consideration given to it that could be found in Bombay?

A.—Yes.

Q.—And if this vibration continues you think it is due to some constructional weakness somewhere?

A.—I do not think it will continue.

Q.—I still do not understand why, if you are just going to take the engines out and tighten up a few rivets in the frame, how that is going to stop the ' up and down ' movement?

A.—That was noticed when we did our work before. The object was to get the vessel out as soon as possible to continue the work. It has developed since. This up and down movement necessitates the engine being properly balanced and when that is done I do not think there will be any more trouble.

Q.—Have you had the engine indicated?

A.—I think they have.

Q.—I think there it was a difference of power indicated in the cylinders?

A.—I do not think that will cause up and down movement.

Q.—Now that the engine is taken out, you will be able to go right down into it?

A.—Yes.

Q.—And probably improve the whole engine?

A.—I hope so.

Q.—I hope you will press upon the absolute importance of seeing that it is done satisfactorily.

A.—Yes.

Q.—Have you seen " Sir George Lloyd ".

A.—No.

Q.—You cannot tell anything about it?

A.—No.

Q.—Have you been doing the repairs to the " Jinga "?

A.—No. That is done by a private firm.

Sir M. Visvesvaraya.—You stated that the vibration is caused by constructional defects and by the heavy load on the engines. How that has happened?

A.—It means that the engines at one time have full load from " Sir George Lloyd " and at other time it has not.

Q.—They are not properly adjusted?

A.—I cannot say how they can be. One is dependent on the other.

Q.—The quantity received in " Colaba " is less than it should be?

A.—The quantity received in the " Colaba " is put through from " Sir George Lloyd ".

Q.—It is less than " Colaba " can deal with?

A.—Yes.

Q.—Is there going to be any more trouble?

A.—No, I do not think so. It will be put right this time.

Q.—How often has it been disabled within your knowledge?

A.—Only on these two occasions, that I know of.

Q.—How long each time has it been out of commission?-

A.—About a month in the first instance, I do not know how long in the second.

Q.—I hope " Sir George Lloyd " was on commission even when " Colaba " was under repairs?

A.—Yes.

Q.—You do not know anything about expenditure?

A.—No.

Q.—The remedy then lies in making " Sir George Lloyd " pump full quantity?

A.—Yes that would be the remedy.

Q.—And you do not know anything about " Sir George Lloyd "?

A.—I do not know anything about " Sir George Lloyd ".

Q.—The solution is incomplete then?

A.—Apparently it must be.

Mr. Billimoria.—It has been suggested that the defects are due to mishandling. Is that true?

A.—I do not think that is the cause.

Q.—Was there any improper handling to your knowledge?

A.—No.

Q.—The defect in the engines was not due to mishandling?

A.—There is no defect in the engine. The engine is working at 150 revolutions and is doing very well.

Q.—What about ' that this is considered a serious defect which can develop to a dangerous extent '?

A.—That is the seating below the main engine on which the engine is secured. It is a table on which the engine is fastened and it is the seating which is defective.

Q.—Is that defect due to the builders' design or due to the mishandling of the ship?

A.—No.

Q.—Due to the builders?

A.—No, I cannot say it is the builders mistake because the seating is well made and well built.

Q.—Is that due to the working of the vessel?

A.—Perhaps working together.

Sir Frederick Hopkinson.—If you see one part slide part another that is " working ".

Mr. Billimoria.—Do you think it was caused by over-working?

A.—It is not over-working, that is actual working.

Q.—Then what it is due to?

A.—It is due to vibration, nothing more or less.

Q.—Dc you find such defects in all the vessels.

A.—You find vibration in any vessel and in very large vessels vibration is allowed for.

Q.—You cannot say who is responsible in that connection?

A.—No.

Q.—Has pipe line anything to do with it?

A.—Pipe line has no effect on the vibration of the ship. That is not a part of the ship but is only joined to the ship at the forward and afterend.

Sir M. Visvesvaraya.—The pipe line is fastened to the ship?

A.—No. It is held in suspension.

Q.—Anyhow the conditions appear to be complex?

A.—No, the conditions are perfectly simple. You can see the pipe on that drawing.

The witness explained the position on the map. (This concluded the evidence of Captain Phillips.)

11th Witness

Mr. S. M. L. Bean, Account Officer of Development Department

Mr. S. M. L. Bean, Accounts and Audit Officer of the Development Department, was then examined.

Mr. Bean's written statement showing the methods on which the accounts are kept.

In describing the method of accounting it is perhaps necessary to mention that the fundamental principle requires an estimate for the work to be done with an allotment of funds, or a specific authority from Government to incur any expenditure.

The estimate sanctioned gives the details of expenditure by the several main heads. Against these main heads detailed working estimates are sanctioned by the Executive officers, and against them the expenditure is booked.

As work is done or materials purchased, the Engineer-in-charge prepares a bill, enters the same in his register of works by sub-heads of estimates where necessary, then submits the bill to the Audit Officer. On receipt of this bill in the Audit Office, it is audited and passed for payment, and the amount thereof as allocated by the Engineer, is recorded in the Audit Registers.

The bills passed in this way during the day are then booked against the Project Heads concerned. Adjustments, if any, are similarly received duly allocated by the Engineer and recorded against the working estimate of the Project Heads. In this way the posting goes on to the end of the month, when the totals are struck and the monthly accounts prepared.

This account shows the expenditure on works, establishment, tools and plant, etc.

The account is then submitted to the Accountant General for incorporation in the Provincial Account, and to the Director for information. The Chief Engineer is also furnished each month with the details of the expenditure by Project heads during the month and up-to-date.

The work expenditure is the actual total of the voucher as posted above.

With regard to the establishment charges the expenditure on establishment in the Reclamation branch is wholly debited to the Reclamation schemes and the other establishment, *viz.*, Secretariat, Directorate and Audit is charged *Pro-rata*, *i.e.*, in proportion to the total expenditure on works and acquisition to the total expenditure on this establishment.

Interest is charged at the rate prescribed by Government (6¼ per cent. at present). Receipts, if any, are treated as receipts on capital account and deducted from the total expenditure. These are of the nature of rents of buildings, the sale of surplus materials, etc.

At the close of each month the registers maintained by the Engineers are verified with the registers maintained in my office. Any wrong allocation, etc., noticed is corrected by adjustment in subsequent months.

In this way the compilation goes on from month to month till the end of the year when the annual Capital and Revenue accounts are prepared.

The progressive expenditure is then struck and compared with the provision made under the major heads of the sanctioned project estimates and any probable excess brought to the notice of Government.

Chairman.—What is your full name?

A.—S. M. L. Bean.

Q.—Are you the Audit and Accounts Officer to the Bombay Development Directorate?

A.—Yes, Sir.

Q.—How long have you been in that position?

A.—Since February 1922.

Q.—Do you happen to know the passage in Sir George Buchanan's report in which he criticised, before you were appointed, the way in which accounts were kept in the Development Directorate?

A.—Yes.

Q.—The report is actually dated 11th February 1922 and says (Sir George Buchanan) "My excuse for writing at length on this subject, apart from its general importance (that is on the question of accounts) is that the accounts of the Back Bay Scheme do not appear to be kept one way or the other of the systems described above. Although works estimates have been made....."

Q.—Were you aware when you came in February 1922 that Sir George Buchanan had criticised the accounts of the Development Directorate in that way? (Referring to his report dated 11th February 1922.)

A.—No, Sir.

Q.—When you arrived did you find that the accounts were up-to-date?

A.—Yes. Sir George Buchanan asked for the figures and the figures of the completed accounts up to the end of October were furnished, but he could have at any time got the figures up-to-date. It was simply a question of totalling.

Q.—You see the form of his complaints. He says he asked for the figures up-to-date on the 7th January and on the 18th January was provided with figures which were correct only to the previous October. If that is so it would point to some disorganisation of the Accounts Department. Would it not?

A.—For the accounts maintained in the Development Office we have to rely on figures received from the Accountant General for adjustments and these adjustments come in perhaps a month or two later. If however any figures are required they can be given at any time.

Q.—Did you know that Sir George Buchanan was pressing Mr. Lewis for monthly accounts?

A.—No, Sir.

Q.—Have you altered the system now since you came in?

A.—Yes, Sir.

Q.—Would you just tell me, suppose after February 1922 it was necessary to buy £10,000 worth of plant. What happens? The Engineer explains to the Director that the plant is necessary?

A.—Yes, Sir.

Q.—Does the Director then apply to Government for sanction?

A.—Yes.

Q.—And if that sanction is given the order is given to the manufacturer?

A.—Yes, Sir.

Q.—And the manufacturer sends the bill to whom?

A.—To the Engineer.

Q.—And to whom does he pass the bill on?

A.—To me.

Q.—And then from whom do you get payment?

A.—I pay it myself. I pay and then enter that payment as a charge against the project.

Q.—Now with regard to weekly expenditure on wages for instance, do you know to-day what has been the expenditure up to last Saturday?

A.—No, Sir.

Q.—Do you know what was the expenditure up to 31st July of this year?

A.—Yes, Sir.

Q.—Could Sir George Buchanan, if he were still the Engineer to-day August 1926, make against the Development Directorate the charge that he made in February 1922?

A.—No, Sir.

Mr. Billimoria.—Will you be in your office at 10-30 on Saturday? If I came round could I have a look at all your books, and see how you are maintaining accounts?

A.—Yes.

Q.—Do you maintain any accounts on the costing system?

A.—No. I have nothing to do with the detailed working of the costing system.

Q.—Who prepares the estimates for works?

A.—The Engineer.

Q.—What is the procedure adopted with regard to the allotment of funds and who sanctions it?

A.—The funds are first placed at the disposal of the Department by the Legislative Council under the head " 59, Bombay Development Scheme ". The Development Department then distributes the amounts to the various project heads.

Q.—What are the main heads of capital expenditure against which expenses proposed to be incurred during the course of the year are debited?

A.—There are 23 heads in the project estimate.

Q.—Have you got any form here?

A.—I have got forms of the accounts for the month ending June. (A form was handed in by witness.)

Sir Visvesvaraya.—Have you not got anything beyond these giving more sub-heads, more details?

A.—I do audit against detailed estimates.

Q.—You have got detailed abstract estimates for each of these separately?
A.—No.

Q.—Have you not got a detailed estimate for the dredging plant?
A.—In the original estimate that was framed there are certain details. I insist on those items being adhered to.

Q.—If the Engineer spends any amount up to 134 lakhs you will pass it?
A.—If he were to send in a bill which does not comply with one of the heads I will not pass it.

Q.—If he says, ' Dredging Plant ' you will pass it?
A.—Yes. Otherwise I will hold it under objection and report the matter.

Q.—Whom do you report the matter to?
A.—To Government.

Q.—What is the result?
A.—The Government takes the necessary action. They issue orders to the Engineer to stop the work or ask him for an explanation.

Sir Visvesvaraya.—For all details the Chief Engineer is responsible?
A.—Yes.

Q.—Is there any accountant under the Chief Engineer?
A.—There is an accountant attached to the Deputy Chief Engineer's office. He keeps an account in detail in his office. The accounts are agreed once a month. I inspect the offices either personally or through my assistant once a year.

Q.—You take into account the amounts you actually pay. You do not take into consideration any outstanding bills?
A.—No.

Q.—So if the estimates have already been exceeded and even if there are large outstanding bills, they are not brought to your notice?
A.—No.

Q.—You do not know the liabilities of the Department at any time?
A.—No.

Q.—It is entirely the responsibility of the Chief Engineer?
A.—Yes.

Q.—At what stage do you come to know liabilities?
A.—When the bills come.

Q.—If there is an excess over project what happens?
A.—If it is a small excess over the project Government will pass it. If it is big Government will ask the Engineer why there was this excess.

Q.—To whom will you report the excess? To the Accountant General?
A.—Yes, who eventually reports it to the Auditor-General. And I also report to the Local Government.

Q.—Have you any instances in which such estimates have been exceeded?
A.—Yes, I made a report on the accounts for the year ending 1925, and I pointed out that several heads under the project estimate had been exceeded, especially Head 12 where the work done was something like 4 per cent. and the expenditure 20 per cent. and that it looked as if there was going to be a very considerable excess under this particular head and that some drastic measures were necessary.

Q.—What happened to that?
A.—Government have taken action. They are looking into the whole question.

Q.—When was this report made?
A.—About December last year.

Q.—Between December last year and August this year no action has been taken?
A.—They have been taking action all along. The Engineers have been asked why there is this excess and why dredging costs so much more.

Q.—You do not know the results?
A.—No.

Q.—Do these estimates show separately the portions expended on capital and revenue?
A.—No, they cannot. So far as the Back Bay scheme is concerned it is all capital expenditure.

Q.—And you only maintain these heads?
A.—Yes.

Q.—What is the total amount of estimates in this connection that you are sanctioning or passing bills for?
A.—702 lakhs. That is the total estimate.

Q.—How much have you spent so far up to the 31st July?

A.—The expenditure without interest is 4,74,51,372.

Q.—How will you add interest?

A.—Every month interest is added to the expenditure. The rate is already fixed by the Government for the year. The rate at present is $6\frac{1}{4}$ per cent.

Q.—When the actual loan is for $6\frac{1}{2}$ per cent., why is it so? It was stated in the previous reports that interest taken into account was 7 per cent. The estimates were made on that basis. Has there been any special reason for reducing interest?

A.—The average of the actual interest paid by the Bombay Government works out at $6\frac{1}{4}$ per cent., and this rate is subject to change every year.

Sir M. Visvesvaraya.—What according to your accounts is the sum at charge including interest?

A.—Up to 31st July it is 59,767,140. To start with, interest was taken at 7 per cent., and it was gradually reduced, and if we are able to borrow money cheaper the rate of interest will be reduced.

Q.—What is the record with regard to employment of labour?

A.—Muster rolls.

Q.—Who checks them?

A.—The Engineer. They are sent on to him by his subordinates for check.

Q.—There is no check maintained in your office?

A.—I get a muster roll prepared by the Executive Engineer with the names of the labourers on it, and I audit that muster roll and then make the payment.

Q.—What about materials and stores? Are the original bills submitted to your office for payment?

A.—Yes.

Q.—Do the Engineers retain any copies of those bills?

A.—Yes.

Q.—Is there any record kept for the purchase of stores such as coal, etc.?

A.—In the Executive Engineer's Office.

Sir M. Visvesvaraya.—Do they render you materials at site acount every month?

A.—In most cases they have not had such an account because they use material as soon as they purchase them.

Q.—There is no regular account kept and audited?

A.—That is audited once a year when the inspection of the Office takes place.

Q.—Is the account kept in the subordinate offices by the accountant?

A.—Yes.

Q.—If you make a payment for an item such as coal, do you distribute it under several heads?

A.—The bill is allocated by the Engineer and I post it according to the allocation given by him.

Q.—Do you maintain any allocation registers?

A.—The Deputy Chief Engineer allocates the bills and sends them to me, and I post them to the heads to which they have been allocated.

Q.—Does the audit register show the total amount of payments during the course of the month under the particular head?

A.—Yes.

Q.—What are the subsidiary heads?

A.—I have got no subsidiary heads.

Q.—Do the subordinate offices keep them?

A.—Yes, with all details.

Q.—To which heads of accounts are the salaries of employees and officers in the works debited?

A.—There is a head, "Establishment" in the Project Estimate. I take the whole amount to "Establishment".

Q.—None of these items include interest?

A.—Not in the estimated amount. But interest is added to the total expenditure each month.

Q.—Is it separately shown?

A.—By project heads, no. Interest is added to the total expenditure for the whole of the scheme every month.

Q.—In your note you refer to some Capital Receipts. What is the nature of those receipts?

A.—Surplus stores and articles that are of no further use are sold. These are credited and treated as a reduction of capital expenditure. We credit it to the same head of expenditure to which the original item was debited.

Q.—What do you mean by some " rents "?

A.—Those are rents we receive for the bungalows that are occupied by the Chief Engineer and the Deputy Chief Engineers. Those are credited to the capital account.

Q.—If there is any wrong adjustment, do you get it subsequently adjusted?

A.—Yes, next month.

Q.—When passing these vouchers under those various heads you have now mentioned, do you do so against the 4 crores estimate or the 7 crores one?

A.—On the 7 crores 2 lakhs estimate.

Sir M. Visvesvaraya.—Can you give us the actual expenditure by sub-heads of this estimate. For example we have 134 lakhs under dredging plant. We want a similar statement under sub-heads. This is the abstract estimate of the whole project. Can you give us an abstract for each main head? We want the details of the expenditure under the more important heads.

A.—Yes.

Q.—Do they maintain cost sheets daily on the works?

A.—I cannot tell you. I have nothing to do with it.

Q.—Don't you probe into the primary accounts also?

A.—Nothing in connection with cost accounts.

Q.—Particularly about what the dredging is costing, you do not know?

A.—At the end of each month the Deputy Chief Engineer sends me a statement of his costs, and all I do with it is, I take the expenditure he has shown there, and compare it with the actual expenditure booked in my office, and if the total agrees, I have nothing further to say.

Q.—With regard to quantities?

A.—I cannot say anything as to the correctness of the quantities.

Q.—As to what the work is costing, and how the expenditure compares with the quantity of work done you have nothing to do?

A.—I do at the end of each year review exactly what the expenditure is, and I get a percentage of the amount of work done under each head, and then I work it out. If very large expenditure has been incurred and very little done, I bring that to notice.

Q.—Do you prepare any statement about the financial position once a year?—

A.—Yes, that is the review showing the percentage of the work done, and the percentage of expenditure.

Q.—Do you keep establishment charges separate?

A.—Yes.

There is a head " Establishment " under the project head. You will find it on the page I have handed in.

Q.—That is practically a copy of the sanctioned estimate. Have you made any alterations or broken it up?

A.—Yes. There was a talk of revising the project estimate of 702 lakhs. They revised it and distributed the expenditure under several other heads. But the estimate has not been sanctioned yet.

Q.—There must have been excesses under several main heads?

A.—Yes.

Q.—Do you hold the expenditure under objection?

A.—Yes.

Q.—Is there any review of the commercial results once a year regarding interest charges, how the capital has been spent and so on? Do you make any remarks on the results as productive work?

A.—It is impossible to do that until the work is completed.

Q.—Is there any rule laid as to the year in which the productive nature of a work could be tested?

A.—Yes. I understand that the scheme was to be finished by the year 1929-30, but owing to dredging operations having failed to the extent that they think it unlikely that it will be completed in that year.

Q.—You do not go into the profit and loss acount?

A.—No.

Q.—Could you give us an estimate of what the loss would be if the work stops after building blocks 1 and 8?

A.—I cannot say.

Q.—You could help the engineering officers?

A.—To a certain extent.

Q.—Supposing we give you figures, could you calculate what the financial results would be, assuming that the expenditure is distributed over three years, four years, six years and so on?

A.—Yes.

Q.—I suppose you have a current account of expenditure?

A.—It is all capital account.

Q.—By current expenditure I mean expenditure on the detailed working of the pumps, etc., the expenditure from month to month?

A.—That is maintained by the Engineer.

Q.—You say the Chief Engineer is also furnished with particulars each month. Which Engineer?

A.—The Chief Engineer of the Back Bay Reclamation Scheme.

Q.—You say with regard to establishment charges the expenditure under establishment in the reclamation branch, is wholly debited to the reclamation scheme and that for the establishment of the Secretariat you charge *pro rata*. What does that represent in percentage?

A.—It depends entirely on the total amount of expenditure incurred.

Q.—The Development Directorate, for example, have got several other schemes besides the Back Bay Scheme. What percentage of the works expenditure does it come to so far as the Back Bay is concerned?

A.—For the present Back Bay comes in practically for the whole of the expenditure.

Q.—What does that come to roughly per month?

A.—Roughly about 13,000 a month. I cannot give a fixed figure.

Chairman.—Will you kindly give it to Mr. Billimoria?

A.—I will give it to Mr. Billimoria.

Q.—What does the audit expenditure come to?

A.—About $\frac{3}{4}$ lakh a year. The expenditure is purely a book transaction. It is not charged, it is paid by the Government of India and charged under the head 23-Audit. It is not paid, but to arrive at what the cost would be, the Audit expenses are added.

Q.—Do you deduct that from the total expenditure?

A.—Yes.

Q.—It is charged to the Government of India?

A.—Yes. The Government of India pays the audit charges.

Q.—What is the designation of your appointment?

A.—Deputy Accountant General.

Q.—What is the test usually applied to these works to find out whether they are productive or not in the end?

A.—Yes.

Q.—What monthly returns you send to the Chief Engineer, if any?

A.—A statement of the whole account showing expenditure under the different Project heads month by month usually by the 20th of the month.

Q.—Are those accounts complete?

A.—Yes.

Q.—Do they give any certificate that they have incurred no further liabilities?

A.—They may have incurred some liabilities which they have not paid for.

Q.—Do you consider the present account control sufficient and satisfactory?

A.—Yes.

Q.—Who keeps a complete statement of the establishment employed on the works?

A.—The Deputy Chief Engineer.

Q.—I mean the official staff?

A.—They are kept in my office.

Q.—How often do you audit the stores account?

A.—Once a year. In some cases it is done half yearly.

Q.—Do you make an inventory of the entire property of the Back Bay project once in six months or a year?

A.—Each division has got its own property and they keep a list of each property.

Q.—And they do not send them to you for audit?

A.—Yes.

Q.—Do you compare what additions are made during the half year, etc.?

A.—Yes.

Sir Frederick Hopkinson.—Am I to understand by the 20th of the month the total payments up to the end of the last month?

A.—Yes

Q.—Therefore he knows exactly the total cost of the work up to the end of the preceding month?

A.—Yes.

Q.—I have seen one of these reports and I found somewhere that somebody connected with the audit department said that he did not think costing clerks necessary. Do you know where it appears?

A.—I think there is a statement to that effect.

Q.—You do not remember who it was that said so?

A.—I do not know.

Q.—No costing accounts were necessary?

A.—No.

Q.—Do you know it is absolutely impossible to carry on properly such works as these without costing accounts from a business point of view?

A.—Yes.

Q.—That an engineer does not know whether he is gaining or losing unless he knows the cost, do you agree?

A.—Yes.

Q.—And you will agree that the costing clerk is one of the most important functionaries of the works?

A.—Yes.

Q.—How do you allocate different kinds of expenditure to different heads?

A.—The bills sent are already allocated by the Engineer.

Q.—I mean more particularly the muster roll.

A.—They are also allocated by the Engineer when they are sent for payment.

Q.—Take the locomotive. In the afternoon it is taking building material to the storm drains. How is it kept by the Chief Engineer?

A.—How, I do not know.

Q.—Does the Engineer keep cost statements?

A.—Yes.

Q.—And are these clerks under you?

A.—I asked that the costing clerks should be placed under me and Government decided that they should be directly under the Engineer.

Q.—I understood you to say just now that all expenditure was charged to capital account?

A.—Yes.

Q.—Is it not different from what used to be done? For instance, " Sir George Lloyd " is on the capital account, but the oil burnt is a working charge. Should not that be kept separate?

A.—The whole expenditure is charged to one account.

Q.—This is an audit point of view?

A.—I do not look at it in that way.

Q.—How are you to get out the cost of the dredging unless you keep separate the working costs?

A.—They are kept by the Deputy Chief Engineer. So far as costs are concerned with any process, that is all kept in detail by the engineers.

Q.—Yours is a very minor part?

A.—Yes, so far as technical points are concerned.

Q.—In a letter dated the 3rd June 1922, Messrs. Meik and Buchanan wrote—" We beg to remind you that before leaving Bombay at the end of February Sir George Buchanan writing on our behalf, as per copy enclosed, requested that we should be furnished with a monthly report and expenditure statement, and on the 12th April we wrote from this office sending forms of progress report to be filled up. To neither of these letters have we received an acknowledgment ". Could not the engineers have given them a monthly report and expenditure statement?

A.—Yes.

Q.—Was the monthly statement from the commencement of the work?

A.—I cannot tell you.

Q.—It is very important that the engineer should know about this from the business side?

A.—He has got the detailed accounts.

Q.—You do not pay the amount until he certifies it?

A.—No.

Q.—Again yours is a very minor part?

A.—Yes, so far as technicalities are concerned.

Q.—The only thing you can check is the arithmetic of the accounts?
A.—Yes.

Q.—How often does the Engineer send you the accounts—once a month?
A.—It depends on when the bill comes in.

Q.—It does not come to you periodically?
A.—No.

Q.—What does your audit consist of?
A.—I cannot check the quantities but I can check the rates.

Q.—But the Engineer himself does it once, and yours is an additional check?
A.—Yes.

Q.—Beyond this your checking is of no value whatever?
A.—I also look into the bill to see that the charges that are included in it are legitimate for that particular work.

Q.—I see another letter from the Acting Chief Engineer of June 1922 on the subject of cost staffs. There he says:—" I had a conference with the Director and Audit Officer a few days ago and the Director has agreed to ask Government sanction for a Cost Assistant for Kandivlee as recommended, the appointment of the Cost Assistants for Marine Lines and Colaba to be postponed till a later date. Government sanction to the Cost Assistant for Kandivlee has not yet been received." Suppose an Engineer decides to do a certain work in a certain way. If he has experience, he knows or ought to know how much a cubic yard would cost?
A.—He knows his project estimate included so much in the total for labour, which is so much per cubic yard.

Q.—If he cannot know the costs how can he comply with his own estimates?
A.—No.

Q.—You said you have a muster roll. Who makes it—the Engineer in charge?
A.—He makes the muster roll and he signs it.

Q.—What do you do? You do the arithmetical checking?
A.—Yes.

Q.—How do you do that? Do you separate the labour costs?
A.—They are all allocated.

Q.—A man may be doing half a dozen things a day.
A.—All allocation is done by the Engineer. The Bill he sends to me has the allocation given.

Q.—With regard to the muster roll, what do you do with it in the way of checking?
A.—I look into the arithmetical calculation.

Q.—That is all?
A.—Yes.

Sir Frederick Hopkinson.—The point I wish to make is this, that it is the engineer who is responsible for practically everything?
A.—Yes.

Q.—And that what you do is to take his figures?
A.—Yes.

Q.—And if he is wrong the whole work is wrong?
A.—Yes.

Q.—And you can do nothing?
A.—No.

Q.—You require a big staff for your accountancy?
A.—I have got to accept the engineer's figures.

Q.—No getting away from it?
A.—No.

Sir M. Visvesvaraya.—You keep a money record of the transactions?
A.—Yes.

Q.—You have no means of checking his figures?
A.—No.

Q.—Do you get the muster rolls checked?
A.—You mean the actual labour on the spot? No, that is done by the engineer.

Sir Frederick Hopkinson.—On 14th July 1922, Mr. O'Rorke writing to Sir George Buchanan, says " Government have refused to sanction the appointment of the Costs Assistant as asked for in Lewis's note on Costs; but this I think can be got over." To that extent the work was heavier?
A.—That is so.

Q.—He could not do all that he had to do?
A.—No.

Q.—You agree with him that such a decision ought not to be made by any business man who understood his job?
A.—Quite so.

Q.—Who keeps the lists of costs purchases?
A.—The Engineer.

Q.—So I really gather from what you told me that the Engineer has got his own proper office staff for accountancy; he ought to have given there every thing necessary;
A.—Yes.

Q.—You were not concerned in these affairs; it does not matter to you whether it is 100 or 200 because it does not interest you at all. You are only dealing with lump sums?
A.—Yes.

Q.—Therefore you cannot help him at all about that.

(The witness was asked to file a copy of the statement of figures in his hand, to which he agreed.)

Q.—Do you know the estimate of 367 lakhs included no interest?
A.—Yes.

Q.—Therefore it in no sense represents the total cost of the works?
A.—No.

Q.—The same thing applies to the 702 lakhs?
A.—Yes.

Q.—And also to the 11 crores?
A.—I have not seen that.

Q.—And if it is made without interest it is only a portion of the total cost?
A.—Yes.

Q.—If you are building a ship which is going to take 2 years, you pay in monthly instalments, you begin paying 3 months after the ship was started, in six months it has got on to a further stage, and if you were asked at the end of the time what the ship would cost, you would include interest?
A.—Yes.

Q.—Therefore it follows that the total cost of this work will never be known until it is all disposed of.
A.—Yes.

The witness withdrew.

12th Witness.

Mr. J. G. Rutherford,, Chief Engineer, "Sir George Lloyd."

Chairman.—Mr. Rutherford, what is your full name?
A.—John Grieame Rutherford.

Q.—What is your office?
A.—Chief Engineer of the "Sir George Lloyd".

Q.—Have you any knowledge of the character of the trials which were made of her?
A.—I came after the trials were finished.

Q.—She arrived here in March 1922?
A.—Yes.

Q.—When did she leave the Clyde, do you remember?
A.—No; I could not say that exactly.

Q.—How long did it take on the voyage?
A.—About 7 weeks.

Q.—You know that she was designed to do 8 knots, was not she?
A.—In calm weather.

Q.—Did she make good or bad passage out?
A.—Good passage out; nothing was broken.

Q.—Now tell us all about the "Sir George Lloyd"?
A.—As far as machinery goes?

Q.—Is she a good vessel or bad vessel?
A.—She is the most perfect machine I have ever had to do with.

Q.—Now, as regards the machinery, has she given any trouble?
A.—None whatever.

Q.—And you as Chief Engineer have no fault to find with the working of the machinery from the time she left England till to-day?

A.—None whatever.

Q.—Will the ship be perfectly ready in October next to take up her station and do the work?

A.—As far as the machinery goes, yes.

Q.—We had a great many figures about her output. I need not take you into those. But what I want to ask you is this. Would it be possible to work the "Sir George Lloyd" 24 hours a days on 3 shifts.

A.—There is no reason why she should not.

Q.—Let me see if I understand you; if you have three shifts, you will still have to cut off a certain amount of time.

A.—Not necessary.

Sir Frederick Hopkinson.—In all pumping operations you lose a certain percentage of time, in getting the various things, anchors, pipelines into position?

A.—That depends on the sort of stuff we have to deal with.

Q.—Every day you have certain minor stoppages and all sorts of difficulties. Up to the present you have had 36 per cent. of time of stoppages, in shifting anchors, taking ladder on board and all those operations?

A.—We did not stop for water; there was one shift for 6 hours.

The Chairman.—Last season, if she was working 24 hours on 3 shifts, there would have been 8 hours every day in which no pumping was being done; there must be a certain loss of time necessarily?

A.—Yes.

Q.—What I want you to tell us is this: Suppose you had three shifts, how many pumping hours do you think you can get in each day of the 24 hours?

A.—As they are working at present, I do not think the hours should be improved at all.

Q.—What I want you to tell me is this; you put on three shifts; the object of putting on 3 shifts is to get more pumping hours; how many pumping hours do you think you could get?

A.—4 more.

Q.—They had been getting some 15 pumping hours a day, do you think on an average you can get 18 pumping hours?

A.—I think so.

Q.—Now then, it is no good having the best dredger in the world if you have not got something underneath her keel which you can dredge?

A.—Yes.

Q.—And you think that three shifts would not have very much effect on pumping material?

A.—Yes.

Q.—Now the "Sir George Lloyd" has always been pumping in the harbour, has not she?

A.—Yes.

Q.—And she could not be used in Back Bay?

A.—I do not know, I have no information.

Q.—Now, what sort of material have you been getting from the very commencement?

A.—First 10 feet of soft silt, the next few clay and sand, and then rock.

Q.—Can you dredge down to 70 feet below water level?

A.—Yes.

Q.—She is designed to cut down into the various grades of material?

A.—Yes.

Q.—And in your opinion, it is one of the reasons for the trouble that has arisen that there was not enough material in depth for the work?

A.—That is correct.

Q.—What do you say about quality? Can she cut through clay?

A.—Yes

Q.—We saw her cutter yesterday, and that cutter is driven by 400 h. p. engines, which is worked in fact for about 130 horse power?

A.—150 horse-power.

Q.—And have you got quite sufficient power to operate a rotary cutter?

A.—It is quite sufficient.

Q.—I think you told us you have no fault to find in any respect with the "Sir George Lloyd" yourself?

A.— No fault whatever.

Sir M. Visvesvaraya.—Except that she does not give the required output you have no fault to find with her?

A.—She does not give the required output.

Q.—Cannot the output be improved by changing the blades of the cutter?

The Chairman.—She does not give the output because there is no material.

Sir Frederick Hopkinson.—There is never more than 20 feet of space, 10 of which is soft and 10 is hard. According to Buchanan they are going to dredge down 70 feet. In that case you begin at the top, and go straight through until you go 70 feet.

The Chairman.—He (witness) says that " Sir George Lloyd " is a perfectly good machine, but he has not the stuff to work on.

Sir M. Visvesvaraya.—If you have got a certain depth why can you not advance faster?

A.—There are a great many difficulties?

Q.—How many hours do you work every day? On an average you work $16\frac{1}{2}$ hours?

A.—Yes; the utmost we can work.

Q.—How much time is wasted without pumping?

A.—Two hours every day.

Q.—That means you actually work for about $14\frac{1}{2}$ hours?

A.—Yes.

Sir Frederick Hopkinson.—You do not keep any record?

A.—No.

(*Sir Frederick Hopkinson to Sir M. Visvesvaraya.*—What you get is the final result for the whole period. He has nothing to do with the actual dredging. He has only to see to the working of the engines.)

Sir M. Visvesvaraya.—If you increase the number of shifts to three, then you say you can keep up pumping for 4 hours more?

A.—There is no reason, if there is plenty of stuff, why she should not run for 24 hours.

Q.—You are losing 2 hours every day now and, more than that, 36 per cent. on an average?

A.—Yes.

Q.—In a month what is the average? There are many days on which there are repairs.

A.—No; all repairs are done on Sundays.

Q.—The addition of a turn shift will make a material change in the output? You accept that?

A.—Yes.

Q.—You said just now in answer to the Chairman's question that you would have four hours more of effective work if you had three shifts; why can you not work 22 hours out of 24? If you work for 24 hours on an average you lose 2 hours a day for shifting; you will get 22 hours effective work hereafter if you have three shifts?

A.—I mean two hours for two shifts ..... (?)

Q.—Then there will be losses due to stoppages?

A.—I had no stoppages.

Q.—Then how many months in all do you work?

A.—Six and a half months.

Q.—For $6\frac{1}{2}$ months you work about 15 hours a day; and in future if you have a third shift, it would be 18 hours?

A.—Yes.

Q.—That means you will increase your output by 20 per cent.

A.—Yes.

Sir M. Visvesvaraya.—The " Colaba " complains that you do not give her enough material, enough water and clay, and that is the reason why there are vibrations in the ship. Do you know anything about that?

A.—There is a certain percentage of leakage through the pipes.

Q.—And the vibration is due to your not being able to pump enough quantity?

A.—I do not know anything about it.

Sir Frederick Hopkinson.—Were there any vibrations due to unequal dredging?

A.—Conditions are different there. Cutters are different.

Q.—Do you have vibrations due to unequal load?

A.—No.

Sir M. Visvesvaraya.—Have you seen other dredgers having cutters?

A.—Yes.

Q.—Are the blades of this cutter different from others. Are there no variations in design?

A.—I do not think all are of one design. There may be difference in the engines.

Mr. Billimoria.—Will you tell us if you are getting the engine spare parts?

A.—Yes; we have a number of spare parts.

Q.—Can you give us any idea of the value?

A.—We have the spare piston rings, spare bolts spare brass.

Q.—Can you give us any idea of the value?

A.—I could not give you that.

Q.—If it is suggested by any one that the output is smaller because she is not properly handled or is being mishandled, is there any proof for such an allegation?

A.—I think she is handled properly.

Q.—And the defect of the output is due to want of material?

A.—Unsuitable ground.

The Chairman.—Is unsuitable ground want of material?

A.—Yes.

Sir Frederick Hopkinson.—Unsuitable inasmuch as it is shallow?

A.—Yes.

Q.—You do not suggest that just because of the longer pipe line the output is shorter?

A.—It may be, but not to that extent.

Q.—So the main fault lies with the water?

A.—With the material.

Q.—Otherwise you say it is one of the best machines you have ever seen?

A.—Yes: I have nothing to complain about.

Sir M. Visvesvaraya.—Where were you employed before joining this?

A.—I was dredging in Malaya.

Q.—How did you get in here?

A.—They required a chief engineer for the dredger: guarantees were signed.

Q.—You sent up an application?

A.—Mr. Simons sent for me.

Q.—You have got experience of working dredgers?

A.—Yes.

Mr. Billimoria.—If she was originally intended for 15 hours and to pump a certain quantity of material would it mean any material difference in cost?

A.—The cost of fuel and lubricating oil.

Q.—Can you compare the 15 hours output with the 18 hours output and give me the extra cost that would be entailed?

Sir Frederick Hopkinson.—The working cost would be approximately the same; it is the overhead charges that will be reduced.

The witness withdrew.

13th Witness

Mr. J. K. Wallace, Assistant Dredging Master

Sir Frederick Hopkinson.—What is your full name?

A.—John Kirkpatrick Wallace.

Q.—You are the dredging master of the 'Kalu'?

A.—Assistant Dredging Master.

Q.—Who is the dredging master?

A.—Mr. Speirs.

Q.—He was for all purposes dredging master?

A.—Yes.

Q.—You are fixed there all day long; you are really the dredging master of the 'Kalu'?

A.—Yes.

Q.—Can you tell us why the output of the 'Kalu' was so low last season?

A.—Every day, we had to go in and dredge flotation, coming in to site from anchor, connect up to pipe line, and dredge from 2½ hours to 3 hours, then let go moorings and proceed to anchor.

Q.—Don't you think it would have been better to use a grab dredger?

A.—It was too hard for the grab dredger they tried on the job.

Q.—Have you any experience of the London blue clay?

A.—I have had no experience, Sir.

Q.—The "Kalu" went into Back Bay and Back Bay is shallow?
A.—Yes.

Q.—So she had to make flotation. How long did she take?
A.—From November to February.

Q.—What time in November?
A.—About the 29th.

Q.—That is really two and a half months, taking the average, to get ready to work; tell us then what happened? How long did she work after that?
A.—She worked up to 30th April.

Q.—That is about 2½ months?
A.—After flotation she worked right on in two shifts to the 30th April.

Q.—After that?
A.—The dredger left the Back Bay.

Q.—Your dredging time this time was only two and a half months?
A.—Yes.

Q.—You remember what the output was in those two and a half months? Was it not 338,000 cubic yards?
A.—I think about that.

Q.—The output might have been quite a good one if you had gone on for seven months?
A.—Yes.

Q.—Why is dredging the berth necessary? Was it coupled with pipe line?
A.—We coupled up every time we came to our berth.

Q.—So the material was not wasted; it was all used?
A.—Yes.

Q.—You worked 15 hours a day; do you know what percentage of material you got there?
A.—She would be doing between 10 and 12 per cent.

Q.—How do you know?
A.—I judged by the vacuum gauge.

Q.—The vacuum changes when you get a fair amount of material?
A.—Yes.

Q.—Is the berth ready for you now?
A.—It will have to go through the same procedure.

Q.—You think that the berth dredged last season is all filled up?
A.—That occurred in the previous year.

Q.—So that you can only count on getting three months real dredging time?
A.—It depends on the sort of stuff.
Q.—It is nice clean sand? Good building sand?
A.—Yes.

Q.—It will take some two or three months to get your floating berth made?
A.—Two months.

Q.—You think you will do it much quicker?
A.—Yes.

Q.—Therefore you could not apply the 24 honrs shift for the two or two and a half months?
A.—No; two hours' flotation, four hours a day.

Q.—Supposing you are required to work 24 hours a day; do you see any objection or difficulty?
A.—I can do it all right.

Q.—I suppose you would be glad to do it if it is worth your while?
A.—Yes.

Q.—Are your boilers for coal or oil?
A.—Coal.

Q.—How do you get the coal?
A.—By loading on the wall and taking it on when we go on the shifts.

Q.—What sort of surface have you got there?
A.—Twelve feet at low water to 18 feet.

Q.—What is the thickness of material?
A.—Nine feet.

Q.—That is your maximum?
A.—Yes.

Q.—You cannot expect to do much there, can you ?
A.—No.

Sir Frederick Hopkinson.—What you need would be a little extra crew ?
A.—We need a third shift.

Q.—Are your boilers fed by oil fuel ?
A.—No, coal.

Q.—What is the depth of face you have got there ?
A.—Twelve feet at low water.

Q.—What is the thickness of material ?
A.—Nine feet.

Q.—That is your maximum face ?
A.—No.

Q.—If you were pumping 24 hours a day ..... Do you advance straight up or sweep across ?
A.—We sweep across.

Q.—You take a sweep of, how much ?
A.—About 240 feet of a sweep.

Q.—Two feet across and lower your cutter ? You go across and then go back again and cut both ways ?
A.—Yes, cut both ways.

Q.—You go along and come back and thus you dig four cuts ?
A.—Yes.

Q.—You are going pretty fast side-ways ?
A.—Yes, working all the time.

Q.—Have you got a bigger face than 6-foot face ? What is the diameter of your cutter ?
A.—Ten feet.

Q.—You will try and get a deeper cut ?
A.—Yes, we are doing that already in soft material.

Q.—That material is not softer.....?
A.—No, after 5 feet it gets harder.

Q.—It ends up in rock ?
A.—Moorum.

Q.—Moorum has rock in it ?
A.—Yes.

Q.—Do you anticipate that if you get another shift next year you will be able to do better.
A.—I can.

Q.—How much better ? Is it a matter of speculation ?
A.—Yes.

Q.—Why do you think so ?
A.—We anticipate that after dredging up the soft material we will get sand instead of clay.

Q.—If your berth does not fill up, your anticipation will be valueless. Have they taken soundings ?
A.—I don't know.

Q.—It is possible in a tug. I think it is a matter so important that they should send a tug at high water ?
A.—Pretty dangerous.

Q.—Not if you have plenty of water. You can do the whole thing in an hour. Don't you think that it is wise to take them ? What is the size of the hole you have made ?
A.—The first cut was 240 feet by 1,000 feet long. The dredger was turned and took three similar cuts of 1,000 feet.

Q.—Altogether, in your cuts you had 4,000 feet by 960 feet. Last year you were pumping right ashore.
A.—Yes.

Q.—Where do you propose to put the "Jinga" ?
A.—The "Jinga"? In the first hole.

Q.—You were going how far away from the " Jinga "?
A.—We can go about 4,000 feet.

Q.—How far were you from the wall when you were pumping last season?
A.—5,000 feet.

Q.—So that if that hole is filled up with sand this year, you won't work the " Jinga "? Supposing that the hole is filled up with sand, she has a material you don't want? Is it not necessary to go 5,000 feet further away from the wall?
A.—We will require the " Jinga " just enough for 5 feet pumping.

Q.—You had done it last year, and you can do it next year. Are you putting the " Kalu " further out to sea and what stuff do you anticipate?
A.—We anticipate better stuff.

Q.—And will it be sufficient for you to go further without digging a hole?
A.—We will dredge our way out from the present position.

Q.—So that at present it will be two boats doing the work of one.

Sir M. Visvesvaraya.—Do you measure the output in any manner?
A.—No.

Q.—Would how much output be increased if the " Kalu " worked in the Harbour instead of in the Back Bay?
A.—She could only go down to 40 feet.

Q.—What is the depth to which the " Kalu " works?
A.—Forty feet.

Q.—And in the Harbour she will have to go deeper?
A.—Yes.

Q.—Have you done that?
A.—No.

Q.—Have you worked in conjunction with the " Jinga " hitherto?
A.—No.

Q.—This is the first time?
A.—This will be the first time.

Mr. S. B. Billimoria.—Have you had any experience.
A.—Yes, in Mexico and Para in Brazil.

Q.—Now you cannot get a better output?
A.—It all depends on the material.

Sir Frederick Hopkinson.—Were you on the suction dredger at Para?
A.—Yes, I have been there.

Q.—Did you satisfy Mr. Thompson?
A.—Yes.

The examination of Mr. J. K. Wallace concluded at 5-40 p.m.

The Committee assembled at 11 a.m. on the 13th August 1926, all the Members being present

14th Witness

Mr. H. A. Elgee, Chief Engineer

Chairman.—What are your Christian names Mr. Elgee?
A.—Herbert Alcock Elgee.

Q.—In April of 1921 did you see an advertisement in the *Times* asking for applications from Contractor's Engineers?
A.—Yes, I did.

Q.—Did you reply to that advertisement in the following terms on the 8th April :—"In response to your advertisement in the *Times*,....." (The Chairman read the application on page 2 of the printed pamphlet "Correspondence with Messrs. Meik and Buchanan regarding the execution of works in connection with the Back Bay Scheme".)
A.—Yes.

Q.—Sir George Buchanan having got that letter, wrote on the 14th of April 1921 to Mr. Lewis who was then in Bombay, "We advertised in the *Times* and Engineering papers and Mr. H. A. Elgee's application stood out far ahead of all the others. I enclose a copy of his letter with a record of his experience....." (The Chairman read the whole letter on page 1 of the pamphlet.)

Q.—On what date did you arrive in India?
A.—On the 23rd of July 1921.

Q.—Was Mr. Lewis in charge then?
A.—Yes.

Q.—On the 28th of July, that is, five days after your arrival, Mr. Lewis in answering a letter to Messrs. Meik and Buchanan said, "with regard to the material to be dredged from the harbour, the quantity to be used for moorum topping, I have noted your remarks and do not propose to go further into the subject until we find by experience what is the character of the material we have to deal with". Did you see that letter?
A.—Not until I took over from Mr. Lewis.

Q.—Did Mr. Lewis tell you within a few days of your arrival that he did not know what was the character of the material he had to deal with?
A.—I do not think Mr. Lewis would have mentioned that to me because I was only in charge of the Marine Line section and had nothing to do with dredging.

Q.—But you were all engaged on common enterprise?
A.—Yes.

Q.—And you were meeting every day?
A.—I do not say that.

Q.—You were meeting frequently?
A.—Fairly often.

Q.—The principal subject of discussion must have been the progress of the Back Bay Reclamation Scheme?
A.—Yes.

Q.—Did he never tell you that he had no experience and no knowledge of the character of the material that he was going to dredge?
A.—No, he did not tell me.

Q.—Would it startle you a good deal?
A.—I think it would.

Q.—The dredger "Kalu" was bought for £75,000 and more than half million put into "Sir George Lloyd" and her pipe line, and on the 28th of July Mr. Lewis, the Chief Engineer, is saying that he cannot make any decision about the material to be dredged from the harbour and the quantity to be used for moorum topping until we find by experience what is the character of the material we have to deal with. From first to last about a million pounds have been put into the dredging plant?
A.—Yes, about that.

Q.—In the Singapore harbour works you were employed upon reclamation of site and dredging?
A.—Yes.

Q.—What is the first essential, to obtain a dredger or to satisfy yourself whether the sea bed is fit for dredging?
A.—I should ascertain what the material composing the sea bed is.

Q.—That it is suitable in quality and sufficient in quantity for your reclamation?
A.—Certainly.

Q.—When you arrived what was the work that you had to do ?

A.—I was responsible for the Marine Lines section, that was for the northern half of the wall. It was originally intended for my section to continue from zero point to 10,000 feet from the north end. That was the part that I was responsible and also for the laying out of the yards at the Marine Lines end where it had connection with the B. B. & C. I. Railway.

Q.—It was to that point that all the stuff from the quarries came ?

A.—Yes. It came to that point to serve both the Marine Lines end and Colaba section.

Q.—How long did you remain in that position, *i.e.*, in charge of the building of that section of the wall ?

A.—Until the 12th of July 1924.

Q.—When you arrived, had any part of the wall been begun at the Marine Lines end ?

A.—There was a small portion of the wall completed by the P. W. D. That was the point from which we had to start.

Q.—As regards block one, the intention was to shut it in by means of the sea wall which would form one boundary and a cross bund which would form another ?

A.—Yes.

Q.—And so you get a completely enclosed space ?

A.—Yes.

Q.—Did you study the specifications as to the manner in which the sea wall was to be built ?

A.—There were no specifications.

Q.—If there were no specifications, how did you proceed ?

A.—I was given a cross section of the wall at the rubble mound and also a plan of the gantry which had already been got out by Mr. Lewis and a longitudinal section of sea bed.

Q.—But there were no specifications of the sea wall provided in any of the papers that came from Sir George Buchanan ?

A.—None.

Q.—You say, you were provided with a cross section ?

A.—Yes.

Q.—Was that sufficient for you as a practical man to enable you to commence the work ?

A.—Yes.

Q.—A very essential part of the scheme was the provision of storm water drains Was it not ?

A.—Certainly.

Q.—That is to say, the storm water is carried from Bombay and deposited in the sea ?

A.—Yes.

Q.—Were there any specifications given to you of the nature of the storm water drains ?

A.—Not until the wall was under construction. Before we came to the point where the storm water drains were required, I was given particulars then.

Q.—Did you see any original estimate in which there was any provision for storm water drains ?

A.—I saw no estimate at all at that time.

Q.—Can you give us now a reference to any document prepared by Sir George Buchanan before the acceptance of the scheme in which there is any mention of storm water drains ?

A.—There is no mention in his original estimate of storm water drains.

Q.—What is the date of the document you are referring to ?

A.—It is page 29 of the report of September 1919.

Q.—On the 11th of February 1922, it was some seven or eight months after that date, Sir George Buchanan made a revised estimate and I am referring to item 9 in that. Do you see there that Sir George Buchanan has largely increased the September 1919 estimate and has added the words " storm water drains ". Is not that the corresponding item to the September 1919 item to which you refer me ?

A.—Yes, it is the same except that Sir George Buchanan has enlarged the first item by the addition of storm water drains.

Q.—The original idea was to use a storm water drain as one of the cross walls ?

A.—Partially.

Q.—Was it highly essential to shut in No. 1 as quickly as it could be shut in ?

A.—No.

Q.—Why not ?

A.—They were not ready for dredging.

Q.—Was " Sir George Lloyd " going to pump into No. 8 first or 1 ?
A.—Into block No. 8.

Q.—The Report of the working of the Development Directorate for the period ending the 31st March 1921 says : " The dredger is timed to arrive in Bombay after the monsoon of 1922 when it is expected to have a compartment of the reclamation area ready for filling ". That means a compartment, be it No. 8 or No. 1, was hoped to be ready for filling in October 1922 ? Is that not?
A.—Yes.

Q.—That of course was never done ?
A.—No.

Q.—How long did it take to build a storm water drain, the cross bund in No. 1 ?
A.—There are two storm water drains in No. 1 but the one near the boundry is storm water drain for No. 7 and before we started that we put in a cross bund of rubble some 100 feet to the north side of the site of the drain.

Q.—By the time that cross bund No. 7 was put in, was the area No. 1 ready to be filled ?
A.—It would have been. We did not complete the bund entirely; we left a gap until it was necessary to complete it so as to allow the free circulation of water inside the block.

Q.—When was it completely enclosed and ready for filling ?
A.—I believe it was some time (I cannot say exactly) in 1923, except for the 100 feet gap.

Q.—There was some correspondence about the cement blocks which were put as protection to the storm water pipe ?
A.—That was not the object. The blocks actually formed the drain.

Q.—We saw a large number of cement blocks, two of which would form a circle ?
A.—They form one section. The blocks alone form the drain.

Q.—The drain is wholly constructed of cement ?
A.—Yes.

Q.—Do you know if there was any investigation of the sea bed at the various points the storm water drains were to occupy before they were attempted to be put in position ?
A.—I can only speak of the Marine Lines end over which I had section taken myself. On drains 6, 7 and 8 I had sections taken specially to ascertain the material in the sea bed and how far down we met the rock.

Q.—That was no doubt both prudent and necessary ?
A.—It was.

Q.—Ought it not to have been done when one was considering the original inception of the plan ?
A.—In ordinary circumstances one would expect it to be done.

Q.—How many storm water drains were there to be ?
A.—There is I and I (a) storm water drains, and there are seven others. There were nine storm water drains that run across through the wall direct. There is also a 10th one which picks up the drainage by the Marine Lines over-bridge.

Q.—Will you take a moment or two to tell me how much in material and labour the cost of those ten storm water drains was ?
A.—I think I have got them. This is Mr. Lewis' estimate. It gives Rs. 64,28,000. That is for the whole of the storm water drains. That includes the secondary drains and the cross drains.

Q.—It is roughly £500,000 ?
A.—Yes, it is roughly £500,000.

Q.—So that for one of the necessary works of construction that has cost £500,000 there had been, as far as you know, no preliminary investigation of the nature of the sea bed over which those storm water drains had to pass ?
A.—Not to my knowledge.

Q.—But had there been such a plan were you not bound to have been told that ?
A.—I think so.

Q.—You would not have been allowed to go making your own investigations. Some one would have said, " We have gone all over that. We know all about it. Here are the documents ".
A.—They had already taken levels in one or two cases. They had already started.

Q.—Were you given any record of the nature of the sea bed which will in any way be of help to you in your laying of those storm water drains ?
A.—No, Sir. I was given a plan and a section showing the surface.

Q.—That was not much use as regards telling you what was underneath the surface ?
A.—None at all.

Q.—And did you naturally experience considerable difficulty in the laying of these storm water drains?

A.—We had considerable difficulty.

Q.—It has been suggested, you know, that Sir George Buchanan by a mistake omitted all consideration of the necessity for storm water drains. Can you tell us of any document which suggests the contrary, a document which suggests that in fact he did recognise the necessity for storm drain?

A.—I have no knowledge of such documents.

Q.—You took over on the 12th July 1924, did you not?

A.—Yes, Sir.

Q.—And became Chief Engineer?

A.—Yes.

Q.—What were the alterations in your duty then when you became Chief Engineer?

A.—I then had control over the whole of the work instead of one single section.

Q.—You had control over the building of the whole wall?

A.—Certainly.

Q.—Had you control over the dredgers, "Sir George Lloyd" and "Kalu"?

A.—Yes.

Q.—Had you anything to do with the quarry at Kandivli?

A.—Yes.

Q.—Then you were in fact in charge of the whole work?

A.—Yes.

Q.—The question of the blocks over the storm water drains was occasioning a good deal of correspondence in 1923. Was it not? If you look at page 81 of the correspondence you find there is a letter dated 18th April 1923 from Messrs. Meik & Buchanan to the Chief Engineer, where they say, "We have examined the proposed arrangement of the storm water drains as shown on plans handed to Mr. Halcrow at the request of Sir George Buchanan". 18th April 1923 is rather a late date to be examining the proposed arrangement of storm water drains, was it not?

A.—It was.

Q.—Then Mr. Lewis writing on the 6th June 1923 says, "Unfortunately owing to the size of the blocks, the method proposed in your letter will require the carriage of one block only at a time in some cases which will slow up work." The fact was that before you received any specifications from Messrs. Meik & Buchanan as regards the storm water drains many hundreds of these cement blocks had been made?

A.—That is so, Sir.

Q.—And when Messrs. Meik & Buchanan suggested a certain method of construction it was pointed out by Mr. Lewis that that method of construction would involve considerable delay. Mr. Lewis was taking the position that if they carried out the work according to the suggestion of Messrs. Meik & Buchanan it would cause considerable delay, because the blocks were so large that the crane would take a long time to travel out and back in setting the blocks.

A.—Yes.

Q.—The matter appears to have come to the attention of the Director, and Messrs. Meik & Buchanan are writing and saying on the 28th June 1923, "We have received your letter No. 2583, dated 6th June, replying to ours of 10th April 1923. From this we observe that the construction of the forms for the concrete blocks and other preparations have now proceeded so far that you have decided with the Director's approval to make no change in your original plans".

A.—Yes.

Q.—Does that point to the fact, the phrase, "in your original plan" that the Development Directorate got out plans because Messrs. Meik & Buchanan had not furnished any?

A.—Mr. Lewis got out the plans I believe without Messrs. Meik & Buchanan being informed.

Q.—But was it not, can you tell us as an Engineer, the duty of Messrs. Meik & Buchanan to give you plans for a construction of this nature costing £500,000?

A.—I think there was some question at the time as to whether storm water drains came under Sir George Buchanan's province. I believe it was a question about whether he would be entitled to his Commission upon the cost of the drains, but I think that was afterwards waived.

Q.—Before the reclamation scheme began Bombay had a method by which storm water passed into the sea?

A.—Yes.

Q.—Can you begin a reclamation scheme and interfere with that water without making provision for storm water drains?

A.—I cannot.

Q.—Would any contractor working on his own leave out so essential a matter ?
A.—No.

Q.—Quite early in your examination I referred you to a statement of Mr. Lewis made five days after your arrival as to his lack of knowledge of the character of the material he had to deal with. I now refer you to a letter of some two years later, 21st November 1923 at page 103 of the correspondence. Is that a letter or a report, the document at page 103 ?
A.—It appears to be a report, Sir.

Q.—It is a document signed by Mr. Lewis, No. 5193 dated the 21st November 1923 ?
A—Yes.

Q.—Look at the last paragraph. " I would point out that we are by no means sure that the filling from the harbour is going to be of use as a means of reclaiming the area ". Does not that strike you as a very extraordinary statement on the 21st November 1923 that Mr. Lewis is still in doubt that the great essential of the scheme, the nature of the bed of the sea is going to be of use as a method of reclaiming the area ? Did you see that letter ?
A.—I have seen it here since I took over from Mr. Lewis.

Q.—You have had a very difficult task since July 1924 ?
A.—Yes, Sir.

Q.—When you saw it did it not cause you a great deal of uneasiness ?
A.—It did.

Q.—And then Mr. Lewis continues, " If it proves unsuitable the fact will become common property about the time the work at Marine Lines are stopped. " Is it not evident that down to 21st November 1923, Mr. Lewis, the Engineer in charge, did not know at all what depth of material, what quantity of material, the " Sir George Lloyd " would work on from day to day ?
A.—It appears to be so.

Q.—There has been a suggestion that the works at Marine Lines should stop ?
A.—Yes, Sir.

Q.—And one objection to the stopping of that work was the public would become uneasy ?
A.—I suppose so.

Chairman.—I think we may almost guess it from the next two lines, " What inference is the man in the street going to draw—' that the whole show has busted '. "

Q.—Now again on the 10th December 1923, Mr. Lewis writes another report. " Messrs. C. S. Meik and Buchanan have reduced their estimate of the yearly output by 20 per cent. although the same machine is to work the length of time ; 7 months in one case and 170 days in the other and it has not yet been put to work. I consider that if material suitable for the filling is met with in the harbour there is no reason to doubt the capacity of the dredger to do its guaranteed output of 2,000 cubic yards per hour or $170 \times 30{,}000 = 5{,}100{,}000$ cubic yards per annum. Certainty would soon be arrived at on this point and estimates worth having will be possible ". So that Mr. Lewis is still in doubt as to material suitable for filling in the harbour. He casts no doubt upon the capacity of the dredger. Now you have been, I suppose, very closely associated with the " Sir George Lloyd " the dredger since you took over in July 1924 ?
A.—Yes.

Q.—Now Mr. Elgee, just tell me, considered as a dredger, and given a sufficient quantity of material down to 70 feet, what sort of work would she turn out ?
A.—It depends entirely on the material.

Q.—We must take it in a more abstract manner. Consider her as a dredger. Is she a well made boat ?
A.—Certainly I should say she was very well built.

Q.—Apart from the low output, has she given you any mechanical trouble of any seriousness ?
A.—No.

Q.—Have you any reason to believe that Mr. Lewis was wrong in his statement, " If material suitable for the filling is met with in the harbour there is no reason to doubt the capacity of the dredger to do its guaranteed output ". Do you agree with Mr. Lewis in that or not ?
A.—Not now, Sir.

Q.—Do follow the question please. For the moment I am now on the capacity of the dredger. I shall come to the material later. Have you any reason to believe that Mr. Lewis was wrong in his statement. " If material suitable for the filling is met with in the harbour there is no reason to doubt the capacity of the dredger to do its guaranteed output ? "
A.—No, Sir.

Q.—Now, the "Sir George Lloyd" has that rotary cutter that we saw, which is rotated by a shaft, and that shaft in its turn is rotated by a 400 H. P. engine?
A.—Yes.

Q.—The cutter works at about 12 revolutions to the minute?
A.—9 to 12 revolutions a minute.

Q.—And is designed to dredge at a depth of 70 feet below the surface of the sea?
A.—Yes.

Q.—The "Sir George Lloyd" is a powerful machine?
A.—She is.

Q.—Has she at any time shown a failure of necessary power?
A.—Not to my knowledge.

Q.—I am speaking since the time you became Chief Engineer. Has she given any failure of necessary power since you were Chief Engineer?
A.—No, Sir.

Q.—Before you became Chief Engineer did you hear of any occasion when she showed lack of necessary power?
A.—No.

Q.—What is the average depth of the water in the harbour in which the "Sir George Lloyd" has been dredging?
A.—Probably 5 fathoms, *i.e.*, 30 feet.

Q.—Then the theory must be that there is 40 feet of dredgeable material?
A.—That varies with the underlying rock.

Q.—I am asking you, in building a dredger specially for the Back Bay Reclamation and specifying that she must be of a capacity to draw at 70 feet below the surface, that implies that there would have been 40 feet of dredgeable material on an average?
A.—Not necessarily.

Q.—What do you think it implies?
A.—She would be able to dredge down to a depth of 70 feet, not that it is necessary there should be 40 feet of material.

Q.—You say the average depth of the water in the dredging area in the harbour is 30 feet. Mr. Kidd could have ascertained that when he was boring, could he not?
A.—Yes, Sir.

Chairman. Stipulating for a dredger that could dredge down to 70 feet, does not that imply that there was 40 feet on an average of dredgeable material?
A.—In places.

Q.—In a sufficient number of places to make it reasonable to incur the cost of a dredger capable of dredging up to 70 feet?
A.—Certainly.

Q.—After all, if you are going to specify for a dredger to dredge down to 70 feet, you have got to pay more for her than if you specify 50 feet?
A.—Yes.

Q.—And therefore a prudent man specifying for a dredger will only want that dredger to reach down to a depth at which he will get material sufficient in quantity and quality?
A.—Yes.

Q.—Did there exist in the harbour 40 feet of dredgeable material?
A.—I believe so.

Q.—Have you got any sections that show it?
A.—Mr. Kidd's borings show that.

Q.—Are you referring to Mr. Kidd's borings?
A.—Yes.

Q.—What has been your own practical experience of being able to find a dredgeable depth of 40 feet of material?
A.—I could not say that off-hand.

Q.—If there are any documents which could help, you may come again after seeing your documents. I am putting it to you that it is important if you can satisfy the Committee that there did exist, when you became Chief Engineer, and does exist today, a dredgeable area of 40 feet of silt, sand and clay, not in isolated patches but over a proper area.

(Witness took a note of the Chairman's statement)

Q.—Can you tell us from your own knowledge, from the end of monsoon of 1924, the dredging season of 1924-25, what depth or face did you find in the harbour?
A.—I have not got that here, but I can ascertain that from the weekly reports.

Q.—Very well, will you give us the average face, I mean the depth of dredgeable material in the harbour?

(Witness took a note of the Chairman's question)

Q.—Something rather serious must have occurred by the 3rd November 1923. You will turn to the letter from Messrs. Meik and Buchanan to the Director of Development on page 101 of the correspondence. You will see paragraph 8, which says "All previous schemes have been based on the assumption that the whole of the material for the filling was obtained by dredging from the harbour by the "Sir George Lloyd" and the "Colaba" working on one pipe alone, or by the "Sir George Lloyd" working in tendem with the "Kalu" and the "Colaba" on one pipe line, but sometime in 1922 the Chief Engineer raised the question of obtaining possibly the whole of the material from the Back Bay itself, thus leaving the harbour side out of the scheme of dredging operations." That is a complete reversal of the whole scheme. This very big dredger "Sir George Lloyd" was bought for no other purpose than to do work in the harbour?

A.—Yes.

Q.—Was one of the reasons why the Chief Engineer left the harbour and dredged in the Back Bay the fact that he was not getting material sufficient in quantity?

A.—It was more in quality.

Q.—Did quantity enter into it as well?

A.—I do not think so.

Q.—What is the matter with the material?

A.—I should think that Mr. Lewis will be able to tell you.

Q.—I am asking you. Did you make any complaint as to the quality of the material, as from July 1924?

A.—I certainly would have preferred to have seen some better material. I do not think it is an ideal material to fill in.

Q.—We are not living in an ideal world?

A.—No, Sir.

Q.—Was it a material upon which the "Sir George Lloyd" was unable to work?

A.—It was a material on which the "Sir George Lloyd" was unable to give a satisfactory output.

Q.—Let us follow that up to-morrow. You have of course been on the dredger often and often pumping?

A.—I have been on board when she was pumping.

Q.—As soon as the cutter touches the upper part of the bed of the sea, what cut of bed did she take?

A.—For the first cut it depends entirely on the depth of the soft material.

Q.—You know the depth of the material, do you?

A.—We can feel it.

Q.—I shall explain the operation. The cutter passes through the water and eventually touches the bed of the sea. How deep into the bed of the sea does it pass to take the first cut?

A.—It depends entirely on the amount of soft material. If there is 10 feet of soft material the deeper she cuts.

Q.—Does she pass straight through the soft material at the first cut?

A.—Practically.

Q.—And that may be anything from 5 to 10 feet?

A.—Even more.

Q.—Does she have any difficulty in dealing with the soft material?

A.—No.

Q.—The cutter rotates a soft material and it is sucked up and passes through over the pump line. You then come down to harder material, and is that clay?

A.—It is clay.

Q.—Let us take an instance of there being 10 feet of the soft material and 20 feet of the harder material, clay. What is the depth of the first cut into the clay?

A.—I should think about 5 feet. I am not quite certain about these points, because I am not an expert. I rely more on my dredging master and on Mr. Brims. As far as I recollect I think it would be about 5 feet into the clay.

Q.—And getting less each time as the material becomes harder?

A.—Yes.

Q.—And you would disagree with Mr. Girdwood who tells us that the cutter had no difficulty whatever in dealing with any class of clay that she came across, except the last 18 inches of the last cut?

A.—I should think so.

Q.—If that be so, it has been established that as regards the cutting operation, *i.e.*, the separation of the clay from the bed of the sea, the "Sir George Lloyd" does its work?

A.—Yes.

Q.—What then is your difficulty in getting your output? Where does the breakdown come in?

A.—There are various factors.

Q.—Will you tell us all of them? Is there not a possibility of insufficiency of material?

A.—In some cases. Other factors are that we have to contend with very strong tides. And this is an important factor. The difficulty is especially with the spring tides which keep the dredger away from the face. Then there is difficulty also with the moorings of the pipe line. They get carried away and during the first two seasons we experienced considerable difficulty in keeping the pipe line in position. We had to get a large number of extra anchors, the difficulty was so great.

Q.—Was it during your time?

A.—Yes. Furthermore to show the difficulty in holding the pipe line in position in the original pontoons that we ordered, there was one anchor allowed for in every four or five pontoons and that was absolutely useless. We have then on the later pontoons allowed two anchors and winches to each pontoon instead of one for four or five; and even that has not proved sufficient. We have had to get heavier anchors to resist the strain. There is also another difficulty that militates against getting an output so far that is the inexperience of the Assistant Dredger Master.

Q.—What is his name?

A.—There are three of them. Mr. Speirs, Junior, Mr. Merret and Mr. Wallace. We had a fourth and he has gone. They have to learn how to handle the dredger, and it makes a very great deal of difference in the output according to the man who is handling the work. One man will get a good output whereas another man does not succeed.

Q.—Are these the principal factors which in your view have resulted in a disappointing output?

A.—They are two of them. A third factor to a certain extent, especially in the last season, has been too long a length of pipe line to pump through.

Q.—You have been using up to 12,000 feet. I am particularly referring to the time when the "Sir George Lloyd" was working alone without the assistance of the "Colaba". She was pumping through over 6,000 feet.

A.—She was pumping up to 7,000 feet.

Q.—Is it fair to condemn a dredger constructed to deliver material through a 5,000 feet pump line, when you put her on to a pump line of over 7,000 feet? You cannot expect a dredger to work on 7,000 as she would on 5,000?

A.—No. When both vessels were working together, I do not think the total length of pipe line has had any great effect on the output. It was more particularly in that one period when the "Sir George Lloyd" was working without the "Colaba".

Q.—The "Sir George Lloyd" designed for 5,000 feet was made to deliver through a pipe line of over 7,000 feet and you got disappointing results. Is that right?

A.— Yes.

Q.—When you coupled up the "Sir George Lloyd" and the "Colaba" and put on a 12,000 feet pipe line, which was 2,000 in excess of the specification, your results were not so bad?

A.—They varied.

Witness continuing said:

On page 34 of the correspondence regarding the agreement with Messrs. Meik and Buchanan there is a statement showing the results of the "Sir George Lloyd" and the "Colaba" working together. For two seasons you can see the lengths of the pipe line for the "Sir George Lloyd" and the "Colaba". The lengths of the discharge pipes are shown, and the results are in the eighth column.

Q.—By whom was this document prepared?

A.—By myself.

Q.—You point out that the above figures seem to prove that the output is not greatly affected by the length of the pipe line but that it is due more to the quality of the material and the tides?

A.—That is my opinion.

Q.—The matters you have spoken to us about are first the fact that the tide is so strong that it moves the dredger away from the face into which the dredger is cutting at the moment?

A.—That is so.

Q.—That may be to some extent, but it should be overcome by seamanship. It is a question of engine power properly applied and steering properly applied?

A.—It depends on the holding power of the anchors. We have put in heavy anchors and longer wires, especially the head mooring, to get a good hold.

Q.—That is no doubt one of the reasons for the failure of the output; but it is not a reason condemnatory to the "Sir George Lloyd"?

A.—No.

Q.—And the insufficiency of weight of the anchors originally sent out and the insufficiency in the number of them sanctioned is not a matter condemnatory of the "Sir George Lloyd"?

A.—No, Sir.

Q.—But the tides, I suppose, in 1918 and 1919 were presumably the same as in 1924 and 1925?

A.—I do not think there was any variation.

Q.—In your view was the specification asking for anchors of 7 cwt. a sufficient specification?

A.—Not from what we know now.

The Chairman.—But what you know now, might it not have been ascertained in 1918 or 1919? The strength of the tides?

A.—The strength of the tides could have been ascertained and also the quantity of the holding power required, that is, whether on the bed of the sea you have got a good holding ground.

Q.—Now you are coming to the point. Is it not perfectly certain that nobody either in 1912 or in 1919 really knew very much about the quality of the material at the bottom of the harbour?

A.—No, Sir.

Q.—You agree with me?

A.—Yes.

Q.—Before you look on a scheme of this kind, was it not the most essential thing to explore the bed of the harbour, yard by yard?

A.—I would not like to go as far as that. I certainly think there are bound to be variations in material in different areas in the harbour. But personally, if I had had the undertaking of the job I would have made some effort to obtain a dredger, either a great dredger or a Port Trust dredger, and ascertained what is the material that is likely to be found on the bed of the sea.

Q.—What is the nature of the experiment you would have made?

A.—I would have preferred a bucket dredger.

Q.—So as to see the sort of stuff you are likely to get?

A.—Yes, because you can in a bucket dredger see the material as it comes out of the bed. The only drawback is that you could not dredge down to 70 feet, but still it would give you a fair average.

Q.—If you were an expert adviser to a contractor who was proposing an estimate for a work, would not you have supplemented your crab or bucket dredger by coreborings?

A.—I would have taken borings certainly.

Q.—And those borings would you not have done with the coreborings or something of that kind?

A.—Yes. I would ascertain the character of the actual material.

Q.—By drilling with a core drill?

A.—Probably.

Q.—Can you suggest any better thing to do?

A.—It depends a lot on the material; in some cases I might suggest if it was a fairly soft material, and might suggest an ordinary boring gear with a shell auger.

Q.—In the methods you adopted your endeavour would have been to give a definite report to your emplorer as to what he would certainly find in the bed of that sea?

A.—I certainly would try and ascertain if any work had been done in the neighbourhood.

Q.—I put you in the position of an expert, being employed by a contractor who sends you out here to tell him what he is going to find if he commences an enormous dredge undertaking, you say you would get either a grab dredger or a bucket dredger that would give you a knowledge of some portions of the bed. You say you yourself would drill, would you do nothing else.

A.—I would make enquiries.

Q.—Having done these things, would you not be able to report to your employer the depths of material you find in the harbour, and the quality of the material as well?

A.—Yes.

Q.—It is a matter of skill and diligence, is it not?

A.—It is.

Q.—By skill and diligence in 1919, the character of the sea bed could have become perfectly well known?

A.—Yes.

Q.—I notice you have not told us anything about the employment of wash borings in your investigation? Have you any experience of wash borings?

A.—No, Sir.

Q.—You know the principle of the wash boring ?
A.—Yes.

Q.—Does it strike you that a jet of water impinging upon this harbour clay would make a pipe line to sink of its own weight through the clay to the depth of 12, 14, or 15 feet ?

A.—I think so, Sir. I have not had actual experience ; it may be so. But judging from work with a jet on a stiff clay which I have carried out in Singapore—we were sinking concrete cylinders 10 feet in diameter and we had to sink them 3 feet into the clay—we had great difficulty in getting cylinders down, even very heavily weighted cylinders ; we had over 200 tons of kentledge and the cylinders refused to go down and I got over that by providing a pump—if I remember right, it was a 6″ pump with a 2″ outlet and a hose and nozzle of one inch. I put divers down into the cylinders, after they had been grabbed out, and the effect of that jet was to cut the clay clean out and the cylinders went down.

Q.—If by means of a jet of water a pipe can grab through this clay of its own weight right down to the bed of the rock, it must be obvious that " Sir George Lloyd " cutter can drill a clay of that character ?

A.—There is one point. I do not know whether in the wash borings they put weight on the pipe ; it may be just the weight of the pipe itself.

Q.—If the pipe was weighted, that is a factor which ought to be mentioned, was it not, in the description of the wash borings ?

A.—I do not know whether it should be or not ; it may be mentioned.

Q.—Is it not essential to mention it if you weighted a pipe, because that would give you some indication of the softness of the clay ?

A.—Yes.

Q.—It is an essential factor ?

A.—That is what I looked for, because it gives you an idea of the quality of the clay.

Q.—The engineer who talks about soft and unctuous clay will give you a better idea of the quality of softness, however unctuous it may be, if he describes in his wash borings whether the pipe gravitated of itself or whether he put 56 lbs. on the top of it ?

A.—Yes ; and also the speed with which the pipe went down. It would naturally go through the softer material quicker. If he is boring at the rate of 10 feet in an hour and then came suddenly down to 5 or 6 feet an hour, the conclusion would be that you have harder material.

Q.—But as regards wash borings in a sea-bed in which you are endeavouring to get, in each case, down to the rock, you have had no experience of that work ?

A.—Not with wash borings.

Q.—The " Kalu " was bought for £75,000 ?

A.—Yes.

Q.—That was long before your time ?

A.—Yes.

Q.—Had she done any work by the time you were Chief Engineer ?

A.—She started afterwards.

Q.—So that the £75,000 lies idle for five years ? She was bought on the 21st November 1919.

A.—Yes.

Q.—And do you know that in addition to that she had to have repairs done to her to the extent of Rs. 3,65,000 ?

A.—Yes.

Q.—So that you have got something well over £100,000 ?

A.—Yes.

Q.—She was to work in Back Bay. At first she was intended to work in tandem with " Sir George Lloyd " ?

A.—I think the original intention with which she was purchased was for work in the East Colaba reclamation. Then it was suggested that she should be used in tandem.

Q.—And eventually she was sent to Back Bay ?

A.—Because the working in tandem was uneconomical.

Q.—Before she could work in Back Bay she had to dig out such a hole beneath her as to give her floatation ?

A.—That is so.

Q.—How long did she take to do that ?

A.— She did not get a berth in the first season's dredging.

Q.—Why not ?

A.—The material was too hard to get to full depth ; we came across a bed of hard stone, sand stone it may be called, it was only a thin bed, but we could not get under.

Q.—That again troubles us very much. Is it fair to say that you took the " Kalu " in the Back Bay and you put her into a position without knowing what was underneath her keel?

A.—We had the borings that had been taken. It was on the strength of the borings that Mr. Brims and I decided to put her on any particular point.

Q.—There must be something wrong about your information, was not that?

A.—The borings were not quite reliable.

Q.—Who took them?

A.—They were taken—I do not know who actually took the borings—but they were taken under the supervision of Mr. Thomas.

Q.—Is it not a fact that the " Kalu " was dodging about the Back Bay the whole of the season trying to find a place for dredging?

A.—That is not true.

Q.—Just tell us what is true?

A.—The true facts of the case are that we decided on dredging her a berth in a certain area so as to be able to keep her in during the whole season, to get her floatation, and before she could do that she had to come in and work for a portion of the time at high water and then go out again on the falling tide. That was why she was dodging about in Back Bay. It was not an economical thing to do, but it was the only possible method of getting a berth for her.

Q.—Could not a berth be dredged by the Port Trust?

A.—I do not think they would bring a dredger into Back Bay for that purpose.

Q.—You remember that this question was being discussed when Buchanan said that the " Kalu " had dredged a berth for herself in three tides on a previous occasion?

A.—That was at Mazagaon Sewree where the material is very soft; very often she was lying actually on the sea-bed. In the Back Bay she could not do so, the bottom is hard in many places; rock is cropping up in various places, and it was absolutely unsafe to leave a dredger like the " Kalu " lying inside at low water and lying aground.

Q.—The question rather arises as to whether it was wise going to Back Bay at all?

A.—Well, it was a question of Hobson's choice.

Q.—Hobson's choice; because you don't get the quality or quantity of material in the harbour?

A.—We might have got material from the harbour, but the extra lengths of pipe lines, and difficulty of pumping would have made it uneconomical.

Q.—Was not that thought of in 1919?

A.—It might have been; it was on that account, I believe it was decided to go into Back Bay to get the material for the reclamation of the northern part.

Q.—And to go into the Back Bay without any sufficient knowledge of the nature of the bed of the sea?

A.—They had taken the borings.

Q.—You were the Engineer in charge when the " Kalu " went into the Back Bay?

A.—Yes.

Q.—Did you get from any source whatever that information about the bed of the Back Bay which you would have given to a contractor that sent you out to exploit? Answer Yes or No.

A.—I would not like to go so far.

Q.—Let us assume that you are sent out by a contractor to Back Bay. He tells you that he requires you to investigate the bed of the Back Bay so as to enable him to prepare an estimate for dredging operations there; will you not tell him that you would take a grab dredger or bucket dredger and that you would take coreborings and that you would continue the operations until you knew thoroughly what was in the bed of the harbour?

A.—Yes.

Q.—Had you when you took the " Kalu " into the Back Bay any information such as would have justified you in writing a report to an employer of yours as to the character of the bed of the Back Bay?

A.—I would have written to him that the borings had been taken, but at the same time I do not place very great reliance on borings.

Q.—I am putting you in the position of a man sent out here to report to your employer at Home exactly what the bottom of the Back Bay consists of. Did you have that knowledge necessary to instruct the employer at the time you took the " Kalu " into the Back Bay?

A.—Not sufficient.

Q.—Have you got it to-day?

A.—We have; yes.

Q.—Can you write a report which would satisfy your contractor in England as to the character of the bed in Back Bay?

A.—Over a certain area.

Q.—Over the area which you proposed to dredge ?
A.—Yes.

Q.—You could to-day ?
A.—I think I could.

Q.—You know how little the "Kalu" did, and you have told us the reasons. They are set out in your letter at the bottom of page 137 and onwards. We have got the whole story there. It begins, "The dredger 'Kalu' commenced pumping tide work on Friday last the 28th November." That letter is a letter to Messrs. Meik and Buchanan dealing with the progress ?
A.—Yes.

Q.—And it gives you that "Sir George Lloyd" began to work on Monday the 1st December.
A.—Yes.

Q.—She lost the whole November ?
A.—Then they were dredging out a berth for the "Colaba."

Q.—Then we get the work of the "Colaba," and that was sent to Messrs. Meik and Buchanan ; and then later you write to him a long letter on the 20th March (at page 140) dealing with the principal reasons for the low output of "Sir George Lloyd."
A.—Yes.

Q.—Now just after you had taken over on the 23rd July 1924, Messrs. Meik and Buchanan wrote to the Chief Engineer. That was in reply to a letter saying that the total quantity dredged is 859,000 cubic yards. The total quantity must have been found to be 528,000 cubic yards. So that Mr. Lewis was explaining to Messrs. Meik and Buchanan that out of 859,000 cubic yards dredged only 528,000 had been deposited ?
A.—Yes.

Q.—And the answer of the 23rd July is this : "We are in receipt of your letter dated 4th July 1924 giving the total quantity dredged from the harbour and deposited in Back Bay, also giving the cost of the work. We cannot say that we are surprised at the figures of quantity, as calculations made sometime ago in this office shewed that at the present rate of progress the reclamation would be completed in 35 years." Rather an astounding statement.
A.—Yes.

Q.—Then they say "The figures that have been sent to us are very meagre and it is impossible to analyse them properly, but so far as they go, the outstanding features appear to be poor results per hour of pumping which rarely comes up to 1,000 tons per hour against the dredger's guaranteed capacity of 2,000 tons, low percentage of time actually pumped against hours worked, and waste of time and capital by only working single shift. We are assured by the manufacturers that given an ample supply of material there is nothing to prevent the pump doing 2,000 tons per hour ; and if that or near that can be achieved and the dredger worked double shift, the output must necessarily be at least trebled and the cost reduced proportionately."

Did later figures show any improvement ?
A.—Yes, they did.

Q.—Did they not show a great deal of material passing through the wall ?
A.—There has been improvement. The output of the dredger, "Sir George Lloyd," in 1923-24 as measured in the Harbour was 859,858, and its deposit as measured in Back Bay was 528,000. In 1924-25 the output as measured in the Harbour was 1,261,986, and the deposit in the Back Bay was 650,000.

Q.—That is, you were losing at least 45 per cent. ?
A.—46 per cent., I believe.

Q.—That is a most serious matter ?
A.—Yes, it was.

Q.—Do you remember in January 1925, some discussion arose about the sealing of the wall ?
A.—Yes.

Q.—Did Sir George Buchanan ever complain before 1925 that the rubble wall was not made according to specifications ?
A.—No, Sir.

Q.—And did you become convinced that this great loss of material was due in part, at all events, to its escape through the rubble wall ?
A.—Certainly.

Q.—And there are the letters and memoranda in which the Director and yourself endeavoured to impress upon Sir George Buchanan the necessity of sealing that wall ?
A.—Yes.

Q.—With moorum?
A.—Yes.

Q.—For some reason which is not very clear Sir George Buchanan didn't think it necessary?
A.—Not until about July or August 1925.

Q.—At that time, in January 1925, Sir George Buchanan, for some reason, didn't think it necessary?
A.—No, Sir.

Q.—But eventually the Director and yourself took the matter into your own hands and sealed the wall?
A.—That is so, Sir.

Q.—And the apparent result of that is that during the last season's pumping you had retained a very much higher percentage of dredged material?
A.—Practically the whole.

Q.—Now, on the 20th of March 1925 (page 140 of correspondence with Messrs. C, S. Meik and Buchanan regarding the Execution of the Works in connection with the Back Bay Reclamation Scheme and the termination of the Agreement with Messrs. C. S. Meik and Buchanan), you were writing to Messrs. Meik and Buchanan about the low output of the "Sir George Lloyd"?
A.—Yes.

Q.—The first is inexperienced Assistant Dredging Masters; the second, nature of material dredged; the third, strong ebb tides; the fourth, bad holding ground for anchors. That was the letter you had in your mind when you were giving the various factors?
A.—Yes.

Q.—Then you deal with the reason why you want a man of experience, because of the difficulty of telling whether the suction dredger is really sucking material up or is merely pumping material or pumping water?
A.—Yes.

Q.—Now, then, at the top of page 141. "The Dredging Master, Mr. Speirs, was working this dredger last season and the output was very much better than it has been this season in spite of the fact that we did not have the same depth of material last season that we have had this season. Owing to Mr. Speirs having to look after the working of the "Kalu" in Back Bay this season, it has been impossible for him to devote his whole time to the training of the men on the "Sir George Lloyd." On various occasions when he has returned on board the "Sir George Lloyd" this season, he has found that the cuts have not been worked systematically, making it necessary to pull the dredger astern and clean up the high ridges left, which were preventing the suction frame from getting down to the full depth." You have got your dredger, you have got your cutter passing in a semicircular way.....
A.—In an arc.

Q.—Yes. You put her forward some feet and make another cut and in the result if you are doing the work symmetrically you leave the whole bottom without ridges?
A.—Yes.

Q.—If you find that when the cutter passes through, the ridge is standing up therefore you have to take the cutter back and clear away those ridges, because they stand in the way of the cutter going down to do her work?
A.—Yes.

Q.—Now, then, the material dredged this season has been approximately as follows:—

The top layer of material which has varied from 8 to 15 feet in depth has been fine silt. The underlying material which has varied from 7 feet to 20 feet has been clay or consolidated silt of a clayey nature, the bottom 2 or 3 feet of which has been very stiff and interspersed with pinnacles of murum in which boulders are embedded. Owing to the hard nature of this murum in which the boulders are embedded, the cutter engine is brought up to a standstill, or the cutter rides over the top and lifts the suction frame up. This naturally lowers the output of the dredger as it is impossible to keep the cutter into the material.

Let us assume 15 feet of fine silt, let us assume 20 feet of clay, let us assume 3 feet of murum. The total depth is 38 feet?
A.—Yes.

Q.—Have you any plan which shows on how many occasions you got 38 feet depth of material?
A.—I have only Mr. Kidd's borings. They constitute the only plan.

Q.—Page 142 of the same letter, "With regard to a weekly progress return for the 'Kalu,' as this vessel is only able to work for an hour or two a day every other week and her output is very small, being only about 225 cubic yards per hour owing to the hard nature of the clay underlying the sand, it is not worth while giving any detailed

report similar to that for the 'Sir George Lloyd'." Now, Mr. Elgee, owing to the ignorance of the nature of the bed in Back Bay, the season of 1924-25 was practically thrown away as far as the "Kalu" was concerned?

A.—Practically. We got the material that was dredged and deposited it, but it was a very small quantity.

Q.—Following that up, Sir George Buchanan had made an enquiry as to whether your plan had been abandoned, and your letter says, "work was commenced in accordance with your plan 3411, which was handed to Mr. Brims and which shows the Dredger 'Sir George Lloyd' to commence dredging in the southeast corner of the area 'K'." That was in the Harbour?

A.—Yes.

Q.—The point selected by Sir George Buchanan as fit for dredging as indicated by him on plan 3411?

A.—Yes.

Q.—I continue your letter: "But on investigation it was found impossible to put the dredger to work in the position shown owing to the presence of rock or boulders projecting up above the surface. Moreover the depth of material available proved to be only about 4 or 5 feet, the majority of this being silt, and it would not have been economical working to attempt to dredge in this position". Can you understand how Sir George Buchanan indicated the southeast corner of area "K" where dredging should be performed by the "Sir George Lloyd"?

A.—I don't know, Sir.

Q.—Doesn't it point to the fact that he didn't know what was underneath the sea in the Harbour any more than the Development Directorate did?

A.—It looks like that.

Q.—The real truth is that when the Development Directorate took up the "Sir George Lloyd" to dredge at the very beginning on the 8th December 1923, they really had no practical knowledge of what was underneath her keel?

A.—No, Sir.

Q.—Can you expect much success in conditions like that?

A.—It will be a chance.

Q.—You have got to have a marvellous luck to buy a million pounds worth of dredging plant, to bring it into a Harbour and hope that everything will turn out well and think you would really find a sufficient amount of material for her to work it. Would you advise a contractor to do that sort of thing?

A.—No, Sir.

Q.—That is putting quite fairly what happened at the commencement of the scheme?

A.—I think that is quite so.

Chairman.—I think we must rise now, because we must have consultation on another matter. We will continue at 3 o'clock.

(*The examination of Mr. H. A. Elgee was resumed at 3 p.m. on the 13th August 1926*)

Mr. Elgee.—Before you begin your questions, may I be allowed to modify two answers that I made this morning. The first was, you asked me what was the average depth of water in the Harbour. I replied that it was 30 feet. But it ought to be "an average of 20 feet at low water". This morning I had in my mind the height of the tide. The other question I think you asked me was, when you brought the dredger into the Harbour you didn't know what was the sea-bed beneath her and I said "No". I should like to modify it by saying, "No, not with any accuracy".

Chairman.—Would you kindly turn to page 166 of the Correspondence, to the letter dated the 15th October 1925. This is a letter from Messrs. Meik and Buchanan to the Government of Bombay, paragraph 3. "The lowness of the output of the 'Sir George Lloyd' is in our considered opinion due to one of two causes, or probably a combination of the two:—

(*a*) unsuitable material, and

(*b*) inefficient handling of the plant.

The unsuitable nature of the material should have been discovered, before or after the purchase of the dredger?

A.—Before.

Q.—Now Mr. Elgee, as an Engineer of long experience, from July 1924, except for your criticism as regards the Assistant Dredging Masters, did you see any inefficient handling of the plant?

A.—Never.

Q.—And are you able to say whether the men who were working the "Sir George Lloyd", the "Colaba" and the "Kalu" were trying their best to get the best results they could?

A.—I am certain they were.

Q.—Just one last word about the "Jinga". The only thing that the "Jinga" has done up to date is to cost money?

A.—That is so.

Q.—The question arose about purchasing her some time in May 1924 (page 150). Mr. Lewis is there writing and saying that the Intermediate Pumping Station would be required for the "Kalu" in the event of her being put to certain work. That was right, possibly?

A.—Yes.

Q.—Intermediate Pumping Station might be a vessel or a Pontoon?

A.—Quite so.

Q.—And the Pontoon could be steam or electrically driven?

A.—Certainly.

Q.—Mr. Lewis says, "The question of how an Intermediate Pumping Station could be provided has been considered. On account of the bad state of the hull of the 'Jinga' it will probably be possible to purchase the machinery comparatively cheaply—a cursery inspection has been made. It is suggested that the vessel should be purchased not more than £10,000 if it can be secured at that price, use the boilers, pumping engine, auxiliary pumps and winches, selling the hull and the remainder of the machinery for what it will fetch. Such a purchase would be made on the result of a favourable report from a qualified Marine Engineer who would value these items. These items together with a new pump, the old one being badly damaged, would be placed on a pontoon which would preferably be built by Messrs. Simons and sent out for re-erection in plates and angles."

The decision that has been come to is to retain the machinery in the original hull?

A.—Yes.

Q.—And next season, do you propose to use her as a booster for the "Kalu"?

A.—Yes.

Q.—Has she been in dry dock for about 18 months?

A.—Off and on since we purchased her.

Q.—And have you any idea of what in addition to the £10,000 the cost of her repairs were?

A.—Rs. 5,40,000.

Q.—About £40,000?

A.—Yes.

Q.—That brings the cost of the "Kalu" to £50,000?

A.—Yes.

Q.—I mean the cost of the "Jinga"?

A.—Yes.

Q.—The Development Directorate paid £75,000 for the "Kalu" and £20,000 for repairs?

A.—Yes.

Q.—The "Kalu" has cost £100,000, the "Jinga" £50,000 and what result have you got up to now from the combined efforts of the two?

A.—The actual amount of dredging would be about 388,000 cubic yards.

Q.—Taking the capital cost of the "Kalu" alone. The output is 388,000 yards. The "Kalu" has been very expensive, isn't it?

A.—Yes, if we stopped dredging now.

Q.—Suppose the question were left entirely to your decision, what would be your plan for the next season?

A.—Do you mean for the work generally, or dredging in the Back Bay?

Q.—Suppose the continuation of the work was left to your decision what would you do as from the end of the monsoon, where would you dredge, would you dredge, would you reclaim by moorum?

A.—At the south end?

Q.—What do you call the south end?

A.—Colaba. Block No. 8. I would put the "Sir George Lloyd" to pump in the Harbour and deposit the material in block No. 7.

Q.—What about block 8?

A.—To my mind, it would be a mistake to put any more dredged material in block 8.

Q.—Then you put the "Sir George Lloyd" pumping into block 7?

A.—Yes.

Q.—Is that a fairly shallow block?

A.—It is.

Q.—Have you got a cross bund?

A.—Not yet. We have got a storm-water drain which is a partial protection and which has been completed.

Q.—How long would it take you to complete the cross bund? Have you got a water-tight wall?

A.—In addition to the sealing of the wall, it will take about four months as estimated.

Q.—Is there any work of sealing that is still in progress, now?

A.—Not at the present moment. We have stopped it.

Q.—Do you think that if you commenced in October or November, it could not be completed before the end of the year?

A.—Not before the end of the year.

Q.—And how long do you think it will take to fill block 7 by dredging?

A.—It would not take long. In 1928 it will be pretty well completed. That is two seasons.

Q.—Let us see. You begin to dredge in January and you could pump in January, February, March and April.

A.—I would start at the beginning of the dredging season. But the wall might be sealed first, because the storm-water drain only allows water to escape between half-tide and high tide. In these tides very little material is wasted.

Q.—You would require the season of 1926–27 and the season of 1927–28?

A.—Part of it (1927–28).

Q.—Allowing for contingencies, it would be safe to assume that by May 1928 block 7 would be filled?

A.—As far as dredging is concerned.

Q.—And ready for moorum when it settles down?

A.—Yes.

Q.—Do you believe that to be a perfectly practical proposition for the "Sir George Lloyd."?

A.—I do.

Q.—The "Colaba" will work?

A.—Will work with the "Sir George Lloyd".

Q.—And how do you propose to employ the "Kalu"?

A.—At the beginning of the season, I should put her into the area that she was dredging during last season because the probability is that we will find a lot of material which has been deposited during the monsoon. I would start and pump that into block No. 1.

Q.—How much is required to complete block No. 1?

A.—After the 21st of June this year, the quantity was 340,000 brass, that is, 1,260,000 cu. yards.

Q.—How long do you think it will take the "Kalu" to deposit that amount in block 1?

A.—I would not deposit the whole of the amount by dredging. I would continue the filling by motor lorries as we are going on at the present day.

Q.—You would fill block 1 by a combination of dry filling and dredged filling?

A.—Yes.

Q.—When do you think that would be finished?

A.—Block 1 would be finished in March 1928.

Q.—Let us say by May 1928. Are you of opinion that blocks 7 and 1 would both be finished?

A.—Yes.

Q.—You have thought that over?

A.—I thought that over and worked it out.

Q.—I am still a little puzzled about your criticism of the material. You say the output was in part due to unsuitable material, do you not?

A.—That was from Sir George Buchanan's report.

Q.—I am asking you?

A.—I don't think the material is suitable.

Q.—Would you explain in what way the material is not suitable?

A.—The dredger does not seem to be able to take it.

Q.—It is clay?

A.—The silt is easily pumped. It is clay.

Q.—Of varying consistency, soft, stiff, hard?

A.—Yes.

Q.—What is the matter with it?

A.—The cutter does not seem to be able to work sufficiently fast to obtain the material. It seems generally too stiff.

Q.—The cutter takes 9 to 12 revolutions a minute?

A.—Yes.

Q.—Have you noticed that when the cutter is rotating at that speed, the indicator shows that the engine has developed about 130 horse-power?

A.—I would not care to say definitely on these points.

Q.—Have you noticed that?

A.—I watched the gauges. I don't know what exactly the horse-power was, but I can say that I have seen the pressure on the pump varying from 35 to 45 pounds. That is on the discharge side.

Q.—You were saying that you were of opinion that the rotary cutter could not revolve sufficiently fast owing to the stiffness of the material?

A.—The cutter seems to jump into.....

Q.—Is there any difficulty in rotating that cutter when it is revolving at a speed very much higher than 9 to 12 revolutions a minute?

A.—It is quite possible, there may be.

Q.—What you have got to do is, you have got to work your cutter at such a speed having such a power behind it as would give the result you want. That is your object?

A.—Yes.

Q.—Subject to this you must not work so that the engine shakes the whole vessel. The "Sir. George Lloyd" showed no signs of having been injured by any vibration did she?

A.—No.

Q.—Do you know of anybody here who can come and say that the clay was so stiff that the cutter was unable to rotate at a greater speed than 9 to 12 revolutions a minute? Is there anybody that you have ever talked to about it?

A.—Only Mr. Spiers and Mr. Brims.

Q.—Do you think that Mr. Spiers will tell us that the quality of the material was so dense that it prevented the cutter rotating sufficiently fast to give the output? That is your point, isn't it?

A.—Not exactly.

Q.—What is your point?

A.—I personally rely on Mr. Brims and on Mr. Spiers and I am sorry to say that I have not had the time to spend many hours on the dredger. Therefore, personally I cannot answer this question from my own knowledge.

Q.—You put forward the theory that it may be the reason for the lower output?

A.—Yes.

Sir Frederick Hopkinson.—Can you tell me, Mr. Elgee, when the road was laid through from the Marine Lines to the Colaba end?

A.—I think it was towards the end of 1922. I could get the actual date.

Q.—What I want to get at is that the work at Colaba could not have been started until the beginning of 1923?

A.—They did start actually before.

Q.—How did they get the material?

A.—Some of the material was obtained at the site like the broken stone. But the cement had to be brought by motor lorry. The space was very confined.

Q.—Do you know when it was decided to complete the wall from the Marine Lines? Had you anything to do with coming to a decision?

A.—No. I simply carried out the orders for carrying on the work.

Q.—Don't you have any specification giving the particulars of the constituent parts of the concrete?

A.—No, Sir.

Q.—Who decided how much cement was to be used?

A.—I decided it myself.

Q.—Is it not, not merely unusual, but unprecedented that you should commence a work of this description and size without any specification?

A.—It struck me as rather peculiar.

Q.—You have got a long and wide experience of contractor's work. Did you ever have a similar case?

A.—No, Sir.

Q.—Was not Sir George Buchanan interested in the state of the concrete?

A.—Later on. At first there was nothing said about it.

Q.—Did he then give the specification?

A.—No, Sir.

Q.—Did he specify the broken stone?

A.—No.

Q.—Did he specify different sizes of the broken stone?

A.—No, Sir. When he came out here, I think it was the first season. After he arrived here he examined the stuff and found fault with it and suggested that the material was too large. But there was no specification.

Q.—Did he ask you how much sand you had put in the concrete ?
A.—No.

Q.—Did he ever know what proportion you had mixed in ?
A.—I think he did.

Q.—He asked the question as to what you were doing ?
A.—Yes.

Q.—Can you tell me the probable cost of the whole of storm water drains when they are completed ?
A.—That is 64 lakhs, I think.

Q.—Has that been estimated ?
A.—That is Mr. Lewis' estimate.

Q.—I want to know if you have made an estimate ?
A.—I have got separate figures for storm water drains but I have not got them here.

Q.—I want to see them and I want to see your own estimate also, the total amount done in quantities and the money value, and also the amount still remaining to be done ? Are you in a position to make such an estimate ?
A.—Yes.

Q.—Have you got sections down to the rock over the line of the storm water drains ?
A.—We have now.

Q.—Since when ?
A.—Since I took over, that is within the last two years.

Q.—Do they show the depth of the rock ?
A.—Not in all cases.

Q.—Therefore I suggest that you will not have sufficient information to make an accurate estimate ? Do you know where the rock begins ?
A.—In many cases the rock is on the surface.

Q.—Have you decided upon the method of construction ?
A.—Yes.

Q.—Of all of them ?
A.—Yes.

Q.—Are you going to use blocks or mass concrete ?
A.—I have stopped making blocks. I am going to use mass concrete.

Q.—Which is more economical of the two ?
A.—I consider mass concrete more economical.

Q.—Can you tell me what information they had when they decided to make those blocks ?
A.—I cannot.

Q.—Do you know if they had any information ?
A.—Just the surface levels.

Q.—Was it intended to cut away the rock and put those blocks over the endward of the soft rock ?
A.—That part of the work was done.

Q.—You have not had that again ?
A.—I have stopped it.

Q.—Are there any piles carrying those drains ?
A.—One small portion, No. 9 outlet.

Q.—Generally they all go down to the rock ?
A.—Not in all cases. Where there is soft material we dredge out a trench and fill it with rubble. In some cases they do not go right down to the rock, but put on the moorum after the grab has got to a hard bed of moorum.

Q.—Is the material overlying the rock ?
A.—In some cases.

Q.—Is this estimate for the storm water drains based on actual cost ?
A.—Yes.

Q.—In each case ?
A.—Yes. This latter estimate we have got is an estimate for each individual drain.

Q.—So that it can be taken as a reliable estimate ?
A.—Yes.

Q.—The estimate made before cannot be taken as reliable ?
A.—No, but that is also fairly near the mark.

Q.—Is not it always the case with any work of this kind that you have a specification giving the most minute and exact details of everything to be done.
A.—Yes.

Q.—None of that has been done in this case?
A.—No.

Q.—It depended on the feeling of the person at the moment how he did it?
A.—More or less.

Q.—In this 2,000 yards an hour that you have been estimating for the "Sir George Lloyd "does that in any case make an allowance for the 36 per cent. of stoppages?
A.—I have not made any estimate of 2,000 yards an hour.

Q.—I think you said that the dredger should do 2,000 yards an hour?
A.—That is the capacity but I do not think she will be able to do it.

Q.—Not even allowing for 36 per cent. of stoppages?
A.—No.

Q.—Have you any idea why they took 2,000 yards an hour and multiplied it by 15 hours a day in order to produce 5,010,000 a year?
A.—I do not think they made any allowance. Apparently they assumed the dredger working for the whole time without any stoppages.

Q.—Did you ever know a dredger work without stoppages?
A.—Never.

Q.—Do you consider 36 per cent. stoppages unreasonable?
A.—Considering the situation all round, I do not think it unreasonable from my experience.

Q. If you were to estimate for this work, would you make in all cases the necessary allowance for stoppages?
A.—I would.

Q.—Have you ever dreamt of expecting the maximum capacity of pumping and multiplying it with the number of hours of the work?
A.—No.

Q.—Would anyone who knew anything about dredging do such a thing?
A.—No.

Q.—If you come across a man who did that sort of thing what would you think of him?
A.—He was a fool.

Q.—I was rather interested with an answer to a question put to you this morning about the increased length of the delivery pipe and the working material put to the pump. How far do you think it can be carried out?
A.—I do not quite understand.

Q.—Supposing the machine is designed for 5,000 feet and it actually has been working 6,000 or 7,000 feet without any difference in her output. How far do you think you could go beyond 7,000 feet?
A.—I think I explained this morning that it did make a difference with "Sir George Lloyd" when she was working alone. The total length of discharge line from dredger to outlet varied from 5,900 to 7,813. At the 5,900 she had an output of 498 yards and at 7,813 she got 436 yards and at an intermediate stage with 6,207 she got an output of 1,007 yards.

Q.—Would you base any estimate on such figures as those.
A.—I do not think so. The variation is due to the difference of material being pumped

Q.—How can you tell me what she was pumping at that time?
A.—By watching the outlet discharge.

Q.—How would you manage to get the quantity of cubic yards per hour?
A.—We have done that by soundings at the harbour.

Q.—How frequently do you take soundings in the harbour?
A.—They take them every day.

Q.—What do you estimate the quantity for next season?
A.—The same as last season. That would be 960 cubic yards per hour.

Q.—You stated that the clay in Singapore was very stiff?
A.—Yes.

Q.—Do you call Singapore clay a hard clay?
A.—It is very very stiff indeed.

Q.—Have you ever heard of anyone making wash borings in the solid clay?
A.—I know very little about wash borings only by hearsay. I have never seen them actually being taken.

Q.—The "Kalu" was bought for the East Colaba Reclamation?
A.—So I understand.

Q.—Do you know why that did not go on?
A.—We started on it but it was stopped.

Q.—Do you know why?
A.—I do not know the real reason.

Sir M. Visvesvaraya.—I think the Sub-Committee recommended that it should be stopped.

Sir F. Hopkinson.—There was no engineering objection?
A.—No.

Q.—One point cropped up this morning for filling a part of the reclamation. Do you think it is a practical proposition to lay pipes right across Bombay?
A.—It is nearly as expensive as a tube railway.

Q.—It would not be reasonably practicable?
A.—No.

Q.—And ought never to have been suggested?
A.—I do not think so.

Q.—Was there any estimate made of its probable cost?
A.—Not to my knowledge.

Q.—I suppose the sight of it frightened them?
A.—I think so.

Q.—Is it a fact that practically the whole of the superintending staff have been appointed by Messrs. Meik and Buchanan?
A.—Yes.

Q.—If you look at page 107 of the correspondence (Pamphlet entitled "Correspondence with Messrs. Meik and Buchanan regarding the Execution of the Works") you will find there is letter from Sir George Buchanan to the Chief Engineer about railway in which it is stated "I am well acquainted with the caterpillar tractor and its particular merit in this case is that the machine being free of any line could go into a quarry face and after loading its bucket return to deposit the material in the wagons wherever they may be standing". It makes one smile?
A.—Yes; it does.

Q.—Have you ever heard of such a thing?
A.—No.

Q.—Do you think the person writing such a letter ever saw such a thing being done?
A.—I do not think so.

Q.—In England or anywhere?
A.—I do not think so.

Q.—Would not you call that stark madness?
A.—Yes.

Q.—Or such colossal ignorance that he did not understand what statement he was making?
A.—Yes.

Q.—On page 9 of the Report by Sir George Buchanan, September 1919, paragraph 28, while criticising Mr. Kidd, Sir George Buchanan says "It is usual when preparing estimates for a project of this magnitude, and especially when the estimates are those on which the authorities are asked to sanction the execution of the work for all details to be furnished but in this case details are left to imagination". Was there anything else left to imagination besides Mr. Kidd's details?
A.—I think pretty nearly everything was left to imagination.

Q.—So that the criticisms that Sir George Buchanan applied to Mr. Kidd, may fairly be applied to himself?
A.—I think so.

Q.—In the same report, page 28, he says: "There is an abundance of material in the harbour for the filling and it can be deposited in the area to be reclaimed by means of modern suction dredgers much cheaper than in any other way". In estimating that there was an abundance of suitable material, I take it that the description is about right?
A.—Yes.

Q.—It is based on the assumption that there is sufficient quantity of suitable material. Has that proved to be the case?
A.—Over the original area there would have been sufficient material for dredging.

Q.—Suitable material?
A.—That was the best available. It is not ideal material.

Q.—But was it suitable?
A.—In the event of not being able to get any other material, it might be called suitable.

Q.—Suitable for the purpose of reclamation?
A.—I think, it will dry up sufficiently.

Q.—May we take it that the whole basis of this scheme lies in having an abundance of suitable dredged material in the harbour which could economically be placed into the reclamation area?
A.—Yes.

Q.—That is the whole kernel of the scheme?
A.—Yes.

Q.—Sir George Buchanan in 1919 had also realised the same thing. Had you been in his position, do you think you would have accepted anybody's statement in a work of this magnitude?
A.—Certainly not.

Q.—Would you have wanted to make borings for yourself?
A.—I would have verified them.

Q.—Would you have decided to take the whole of the material so far as practicable? Would you want to know exactly what would it cost in order to transfer that material to the reclamation area and whether it was possible to do that without taking such borings yourself?
A.—Yes.

Q.—On the question of borings, I have got a statement showing the list of plant taken over from Messrs. Lowther Kidd and Co. In that list the number of pumps is 4 centrifugal pumps and there is no mention of any boring apparatus of any kind for laying 2" length of pipe. Does not that point to the fact that no actual borings were taken?
A.—I do not know how Kidd actually worked his borings. It appears to be some specially improvised plant.

Q.—Would you call it improvised plant, if you get a barge and a little derrick and you put two inches pipe and insert in that pipe a smaller pipe and pump into the smaller pipe as you pump on board? Would you call that improvised plant?
A.—Yes.

I would like to get it on the notes the position of works at the present time and I would also want you to give me a statement of the quantities remaining to be done, keeping each material separate, each block separate, and each storm water drain separate.

The witness promised to supply.

Q.—Two storm water drains have been built in block 8?
A.—Yes.

Q.—The cross-bund has been built in block 8?
A.—Yes.

Q.—In block 7 nothing has been done?
A.—Storm water drain No. 2 is finished.

Q.—For the next block a portion of the storm water drain is done?
A.—Yes.

Q.—But no cross-bund?
A.—No.

Q.—For the next one there is a small portion of drain?
A.—That was just started.

Q.—The next one to that has got a tiny little piece done?
A.—Yes.

Q.—The end of block 2 has got two little pieces of storm drain done?
A.—Yes.

Q.—No cross wall?
A.—No.

Q.—There is a cross-bund in the middle of block 1?
A.—That is the storm drain in the middle of block 1.

Q.—There is another storm drain at Churchgate which is nearly finished?
A.—Yes.

(A statement of all the quantities remaining to be done keeping each material separate and each block separate and each storm drain separate was promised to be handed in by witness by next Tuesday.)

Q.—When you made a start here were you given a general programme as to the way the works were to be carried out?
A.—No, beyond being told I was expected to complete 2,000 feet of wall in the first season of the Marine Lines Wall, 3,000 feet the second season and the following seasons till completion. That was afterwards modified. That was all.

Q.—Was there any intention of pumping into block 1 at that time?
A.—I never heard of it.

Q.—That must have been subsequently considered?

A.—Must be. I had nothing to do with dredging. At that time I had heard nothing at all about the dredging.

Q.—When you became Chief Engineer what were the instructions then about dredging in Back Bay?

A.—It had been decided to dredge in Back Bay, and the position was fixed by Mr. Brims and Sir George Buchanan and myself.

Q.—You produced the plan the other day showing the borings in the harbour, I have got the original plan of the borings. I want to see if yours is a copy of it. Will you just look at this and tell me if yours is a copy of this?

A.—Yes.

Q.—Have you ever plotted those borings on cross-sections?

A.—No, I do not think we have.

(I want you in the next week to have, not the whole of this, but every third, plotted in the form of a cross-section tied up in the centre. At the same time put the outside line giving the area. I want those sections to show the different kinds of materials as given in the borings.)

Q.—There is a plan here accompanying Sir George Buchanan's report of 1919 purporting to give the cross-section I think of this dredging area. Would you mind looking at this drawing No. 3036 and 3037. Is that supposed to be a cross-section through the dredging area?

A.—Yes.

Q.—Do you know where that section is made? (pointing to a particular section.)

A.—That would be shown on the plan.

Q.—Is that the only one for the whole area?

A.—No, I think he has got several cross-sections.

Q.—At any rate that shows there is comparatively small quantity of mud or silt and a large quantity of blue clay.

A.—Yes.

Q.—There is a depth there of 25 feet of clay?

A.—Yes.

Q.—I cannot reconcile that with the figures given on that large plan over there. Mr. Kidd in his report said there was 3 times 25 millions, and that figure 75 millions has never been questioned?

A.—I have not heard it questioned.

Q.—If you deduct 39 millions and 15½ millions restricted from dredging, there is 20,500,000, which is not enough to do the scheme?

A.—Yes.

Q.—So that it would appear that after you were prevented from dredging down to 70 feet and restricted from a certain area, you could not possibly get an area to do the scheme?

A.—Not on those figures.

Q.—Another thing that strikes me as very odd is the mud seems to be largely in preponderance over the clay. Now that cross-section shows from 3/4 to 7/8 clay. Which is right? Who is responsible for these plottings?

A.—I believe these plottings were Sir George Buchanan's.

Q.—Are you sure of that?

A.—I will try and find out.

Q.—As per the details contained in the letter of Mr. Lewis dated 31st August 1921 at page 24 of the Correspondence there is enough material in the harbour to complete the whole scheme and no necessity to go to Back Bay from the point of view of quantity of material.

A.—No.

Q.—From the particulars given on plan No. 1 in Sir George Buchanan's report, it was physically impossible for the dredger to fill up blocks 1 and 2 having regard to the specifications of the pump delivering 10,000 feet?

A.—Yes.

Q.—You think that is the reason they went exploring in Back Bay?

A.—That was one of the reasons.

Q.—When you commenced Marine Lines, did you have a general scheme of operations given you as to how the wall was to be built?

A.—I had only a plan showing the gantry and the cross-section of the wall and a longitudinal section showing the ground levels and nothing else.

Q.—Did they tell you what plant had been provided for building that wall?

A.—I do not think I knew at first exactly what plant had been allocated to that section. I knew there were two pile drivers and two concrete mixers mounted on a stage, and I had a 5 ton crane to start with. That was all. Certain plant had been ordered, but it had not been allocated to particular sections.

Q.—No programme was given to you as to how the matter was thought out?
A.—No, Sir.

Q.—It was left to you to carry on as best you could?
A.—That is what it amounted to.

Q.—No direction?
A.—No, Sir. I was told "There is your job. Get ahead".
Q.—Although you had had nothing whatever to do with ordering your plant?
A.—I knew nothing about what plant was ordered.

Q.—Did you have a copy of that letter to Mr. Lewis from Messrs. Meik and Buchanan of the 25th April 1921 given at page 5 of the Correspondence? The letter begins by saying, "We send you by the same mail plan No. 3244 showing our proposed programme of dredging operations and wall construction, and shall be glad to have your views on the same." Did you see that programme?
A.—I think that was the one I referred to regarding the orders to carry out the 2,000 feet of the wall. That is as far as Marine Lines is concerned.

Q.—Did they not tell you how they had designed to build the works with certain wagons and cranes and other methods?
A.—No, I was not aware.

Q.—Did you not have to transfer the rock from side wagons to end wagons?
A.—No, that was for the Colaba section.

Q.—How does your section compare with Sir George Buchanan's section in his report?
A.—Pretty closely generally. There were variations. Original section showed solid concrete 16 feet wide, 7 feet 9 inches deep. That was afterwards altered to hollow blocks. I made the blocks in 20 feet lengths. I fixed the length myself in the first instance, and when we got orders to make the blocks hollow, then we cut out 12' by 8' by 5' 9".

Q.—I should like you to give me two typical sections of Sir George Buchanan's of 1919 and the section you are speaking of now cast in blocks.
A.—I think I have it.

Sir Frederick Hopkinson.—In the same letter they say "The dredger will begin work about December or January 1922, or even later if the wall in section 1 is not finished, and will fill section 1 from area 'K', pumping through pipe line No. 1." Does section 1 mean block 1?
A.—I think so.

Q.—At what end was the pumping to begin?
A.—That is the south end.

Q.—This programme was made on the 18th March 1921. You commenced dredging in December 1923?
A.—Yes, in December 1923.

Q.—Did Sir George Buchanan on any of his visits explain the difference between the year's estimates?
A.—No. I was not in a position to ask it.

Q.—Can you give us a reason?
A.—I believe it was on account of Mr. Lewis' having an idea to get the material from the Back Bay. That is one of the reasons.

Q.—Mr. Lewis was doubtful about the quality of the material from the harbour?
A.—I believe they took samples with the dredger. Probably it was in 1922.

Q.—In consequence of that experiment he felt doubtful about the quality of the material?
A.—I think it was after he raised the question.

Q.—On page 47 of the correspondence Mr. Lewis says "As regards boring in Back Bay, we have got fairly good results, but I am afraid the plant we improvised is not powerful enough to get through anything at all hard". The object of making these borings was to find out what material was there. But apparently they could not do it and apparently also they were trying to wake washborings which were a failure?
A.—Yes.

Q.—As an alternative for boring Mr. Lewis suggested the purchase of a small pontoon with spuds and asked Mr. Buchanan to make enquiries of Messrs. Ingersoll-Rand & Co. or other people who specialise in such boring plant and also to purchase a Crab. That also means the purchase of a pontoon carriage?
A.—As a matter of fact I had got one crane on board, a barge.

Q.—I have seen it. But is that the intention here?
A.—I cannot say what this refers to. Apart from the one you saw there was another crane I was working with, which I had had on shore. I had put it on a barge just to start storm-water drains.

Q.—This suggestion of buying a Grab and pontoon would take years to come?
A.—Yes.

Q.—On page 50 of the correspondence a letter from Mr. Lewis says, "Borings have been taken over Back Bay. These show that there is a layer of sand and clay varying in depth from 4 feet to 21 feet and averaging about 9 feet in depth over the whole area". Would you call that a suitable depth for a pump dredger with a 39 inch suction pipe?

A.—No, Sir.

Q.—Could you expect to do economic dredging under such conditions?

A.—It is too shallow a face.

Q.—In the same letter (of the 12th May 1922) the following appears—"Beneath this is a bed of closely compacted earthy material and stone. Small samples of this have been obtained, but we have not been able to penetrate this to ascertain the quantity of material of this nature or to fully investigate the possibilities of it being workable by the dredger. So really they did nothing about it?"

A.—No.

Q.—Is there anything in Sir George's report and plans accompanying it showing that any sections were ever taken over the line of the storm water drains?

A.—I do not think so.

Q.—Is there anything in his report to suggest that storm water drains were required?

A.—I do not know.

Q.—When did you first hear that storm water drains were necessary?

A.—Just after I came out here. The question arose about the entrance to No. 9.

Q.—Was it a surprise to you to learn that they were required?

A.—I believe I asked the question of what was going to happen to the storm water drains.

Q.—What answer did you get?

A.—That they would look into the question.

Q.—Was it a surprise to them?

A.—I think Mr. Lewis knew about it, but he had not had the time to go into the question. That was how matters stood at that time.

Q.—But no design had been made for that?

A.—Only the positions had then been fixed. I had a drawing given me, just a typical drawing showing what was required.

Q.—Was it a workable one?

A.—It was.

Q.—It was not designed to suit the ground?

A.—No. I took my own sections.

Q.—In this statement you are giving me, you will show what will be the cost of the outfall when it is completed?

A.—Yes.

Q.—Had you any cross-sections of the general area of the reclamation? I have seen nothing yet.

A.—We have them, Sir.

Q.—Were there any when Sir George Buchanan's estimate was made? He had Mr. Kidd's, but does not reproduce it in any of his reports.

A.—Yes, just one or two.

Q.—Is that all he has got?

A.—I could not tell you that.

Q.—According to the plans attached to Mr. Buchanan's report I think there are only one or two sections shown over the length of 20,000 feet. Is it possible to calculate the quantities in two sections?

A.—Not from that information.

Q.—Have you ever heard of any other information?

A.—No.

Q.—Have you got the detailed cross-sections now used? How far apart?

A.—A hundred feet.

Q.—Right over the whole length?

A.—Yes.

Q.—Do you remember when they were taken?

A.—I do not remember, but they have been going on with them since I have been in charge.

Q.—If you are given a report and plans like this of Buchanan's of the year 1919, would you look upon that as giving sufficient information to carry out the work, or would you look upon it as merely a preliminary report?

A.—Merely as a preliminary report.

Q.—You would not attempt to base an estimate upon such information as you find therein—an estimate upon which you are bound to carry out the work?

A.—No, Sir.

Q.—If such a volume as this were given to half a dozen of the principal contractors in England, do you think that any one of them would present a tender based on the report ?

A.—I do not think so.

Q.—Would you go a little further ?

A.—I would go a little further and say certainly they would not do it. No one will present a tender based on this.

Q.—Were there any borings made on the line of the wall on which to base this report ?

A.—No.

Q.—Would you consider it important that you should be told by a person, who had drawn up a scheme for doing a work and had ordered the plant for doing it, exactly how it is proposed to do it ?

A.—Yes.

Q.—In fact you were told nothing ?

A.—I was told nothing.

Q.—Do you know that Mr. Lewis had experience of similar work to this ?

A.—He was at Rangoon in the harbour works and he had also done some work in the Rangoon river. He had also done some engineering work in the war. Before that he was in the Public Works Department, Burma.

Q.—I want you to give me your opinion on the question of Government departmental work as compared with contract work. Do you consider that the methods of doing work departmentally are economical ?

A.—I think they are, if they have the right men to look after it.

Q.—Do you think it would be efficient to do work on contract ?

A.—No.

Q.—Suppose for instance there is a work to be done. With respect to this work do you think that Government will give the same facilities as a private contractor would have ?

A.—I think so in this case, because it is a special department. It is not the Public Works Department. I do not think that the Public Works Department would get on with it quickly. But here we have got most of the members of the reclamation staff.

Q.—You had a fairly free hand ?

A.—Yes.

Q.—Don't you have a lot of questions to answer, estimates to make and reports and so on ?

A.—Yes.

Q.—Do they occupy much of your time ?

A.—A good deal.

Q.—What proportion do you think ?

A.—In certain months it is less.

Q.—Taking a general average what portion of the time does it take ?

A.—It is pretty hard to say, because it would not be accurate, but I think it would amount to a couple of weeks work in a year.

Q.—Then you cannot complain if anything goes wrong that you had no time to attend to things personally ?

A.—No. The Deputy Chief Engineer gets out the estimates in the first instance. They are then sent on to me for my sanction or approval. I can sanction the estimates up to Rs. 50,000. If they are over that amount I can approve them and then pass on to Government. I can check the estimates in my own office.

Q.—But all this comes under the original amount of the estimate ?

A.—For each portion of the work, for instance the storm drains, an estimate will have to be prepared and sanctioned.

Q.—Each drain or each part of a drain ?

A.—Each drain. If you buy a crane you have to put up a bill. Practically it is a sub-estimate for every bit of work.

Q.—Have you got any knowledge of how Sir George Buchanan made up his original estimate of 367 lakhs ?

A.—No.

Q.—Did he get values of work from anybody in Bombay ?

A.—I could not tell you.

Q.—Would you think it an economical method to complete the reclamation from both ends simultaneously ? You see that the scheme was originally proposed in 1919 was to dredge and fill the area by one dredger. But one dredger could not be working in blocks 1 and 8 at the same time. Don't you think the proper method was to start it at one end, fill it and so finish as you go forward ?

A.—I think that would have been the most economical way of working.

Q.—By that means you would have been able to sell your land as soon as it is reclaimed?

A.—Yes.

Q.—On the other hand, if your dredger was to break down or the material found unsuitable, you could have stopped the scheme without incurring any great loss. But having begun at both ends, how would you stop it? Is not that so?

A.—Quite so.

Q.—I see it was originally intended to build 2,500 feet from the Colaba end, but actually 8,500 feet was built there.

A.—The actual length built at Colaba has been 11,000 feet.

Q.—Do you know why that alteration was made?

A.—I could not say that.

Q.—With regard to moorum filling that you are doing at present, you are only getting one trip in two days out of your wagons?

A.—Yes.

Q.—Could you not get better than that?

A.—We could. At the present time we are waiting to see what is going to happen to the work. It was only just lately, I think it was in June, that the B. B. & C. I. Railway were in a position to take more than their trains. They had quadrupled their line and they can now take anything up to 6 trains. Tenders had been asked for for the filling of block No. 2 and the proposal was to allow the contractor to use the whole of our plant. But I was against it, as, if the contractor uses the plant, we have to stop work.

Q.—You can get better terms from the Railway Company than from the contractor—you can control the unloading?

A.—Yes.

Q.—I propose to go through the cost in your office. We can do it much quickly there?

A.—Yes.

Q.—Can you at the same time give me a section of the moorum or tipping behind the wall?

A.—I can give you that. It is only a 30 feet wide bank.

Q.—What does your lorry filling cost?

A.—We are getting that very cheap, about Rs. 2-2 a brass.

Q.—You have heard that Sir George Buchanan accused the staff of mishandling the dredging plant. Did he on any of his visits make a complaint to you?

A.—It is just the reverse.

Q.—He was satisfied with what you did?

A.—Yes. He said that the dredging staff had done all that was humanly possible.

Q.—You find it difficult to understand why he should say now that it was mishandled?

A.—I do not understand in what way he used the word mishandled.

Q.—He means that it is not handled in such a way as to produce 2,000 cubic yards an hour?

A.—Yes.

Q.—Did he complain about the working of the dredger?

A.—No.

Q.—Did he suggest any improved methods?

A.—No.

Q.—Did he ever show any signs of distress about the output of the dredger?

A.—He was upset about it.

Q.—He sent out one of his staff to look into the working of the dredger. How long did he stay in Bombay?

A.—He was for two or three days on the dredgers.

Sir Frederick Hopkinson.—Did he suggest any improvements?

A.—No.

Q.—Did he accuse you of mishandling it or was he satisfied that the best was being done?

A.—No; I never saw his report. He went home just at the time when the notice terminating his agreement was given to Sir George Buchanan. He had not any fault to find.

Q.—With regard to the dredging in Back Bay for next year, I suggest to you that next year's work is bound to cost more than the past season's work, for the reason that you have got two dredgers going to work.

A.—That is true; the two dredgers will be worked, but the quantity of material will be much greater for the simple reason that except for the last ten weeks of last season the dredger was working tide work. She could only come in on the top of the tide until she could get dug into berth. When she got into position she was pumping 22,000 cubic

yards per week for the last ten weeks, over more than two-thirds of the output of the season.

Q.—At how many hours a day?

A.—The actual pumping hours would be about 12 hours. I have got the hours. It is 406 cubic yards in an hour.

Q.—I should like to have that figure.

A.—I think we should do better with two dredgers.

Q.—If you do not do twice as well the costs will be more.

A.—You must not take the season's output of last year, because she was really working only for ten weeks.

Q.—Mr. Brims was here, and he said that the "Jinga" was reconditioned?

A.—Yes.

Q.—You mean altered?

A.—No; reconditioned.

Q.—She had a ladder, and it was taken out?

A.—Yes; it was just taken out.

Q.—Has it been your experience that the prices have been gradually falling since 1920?

A.—Yes.

Q.—And that an estimate made in 1919 would be at the top of the market?

A.—I think the prices went up after 1919. I would not like to say that definitely, but that is my impression from what I have heard.

Q.—For the last two or three years were they less?

A.—Not lower than 1919.

Q.—In the second report of the Advisory Committee, on p. 23 there is given three columns of estimates, one is Sir George Buchanan's, one is sanctioned estimate by Government and the other is the revised estimate of the Chief Engineer. How was this figure amounting to 1,126 lakhs arrived at?

A.—It was got up when I was on leave. That is the original amount. I believe I have got that particular estimate. It is an important estimate.

Q.—Take the sea wall for instance; your revised estimate is 600 lakhs, whereas the project estimate is 235 lakhs. That is enormous. The sea wall is to be built after other two works. Apparently, several items are lumped together in 1919 estimate.

A.—The whole of the works are lumped together.

Q.—Dredge filling, moorum topping, renewal of pipe lines and so on.

A.—Yes.

Q.—In Gibb's report, he says that moorum can be economically obtained. Do you know what he has in his mind?

A.—I do not know.

Q.—You do not know wherefrom or how it can be obtained?

A.—He put in a price very low indeed. I think he said Rs. 3 a brass. I have not got his report. I remember his having mentioned it because we questioned that.

Q.—Does he mention Rs. 3 a brass? That is about 12 annas a cubic yard?

A.—Yes.

Q.—If you can do that, you can stop all the dredgers?

A.—If we could do that at that price; but we questioned that price. Then Sir Alexander Gibbs, the Honourable Mr. Cowasji Jehangir, the acting Director, Mr. Stileman and myself had a meeting in the Secretariat and this question of Rs. 3 a brass was discussed. Sir A. Gibbs said that he really put in the figure in order to induce contractors to put in a very low price.

Q.—Do you think it will have that desired effect?

A.—I do not think so.

Q.—What is the lowest price you can give for Moorum from the quarry to the Reclamation?

A.—Consolidated material at Rs. 1·57.

Q.—If you had stopped dredging, where do you suggest sufficient material can be obtained? Have you any idea?

A.—It will have to come from Salsette, and the area between Santa Cruz and Kandivli.

Q.—You think sufficient quantity could be got there?

A.—It may be obtained. There is one area, which would probably be sufficient; in Salsette there is plenty of moorum filling.

Q.—You think it would cost Rs. 1½ to bring it down to site?

A.—That is for bringing through the B. B. & C. I. If you have to bring it from Anik in by the Port Trust, you have to work out the cost of getting it here, and it would come to over Rs. 7 a brass. That comes to Rs. 4·92, *i.e.*, practically Rs. 5 against Rs. 7. The difference in cost is due to its having to be handled over a 4'-8½" gauge, then transhipped to

the G. I. P. and again to the B. B. & C. I. So it has to be conveyed through three different lines. We were looking into that with the intention of getting fillings from here.

Q.—There was a large increase of plant?

A.—There has been a very great increase.

Q.—At the rate you are carrying on, it will take 50 years?

A.—Yes.

Q.—That is quite out of the question. If you will double your quantity it will take 25 years?

A.—Yes.

Q.—Did you ever consider whether it was possible to put a booster on shore?

A.—We did consider that, but it would mean too long a pipe line between "Sir George Lloyd" and the booster.

Q.—It was considered?

A.—Yes.

Q.—In the Director of Development's notes, he gives a total estimate of 9,27 lakhs in his advance statement. I cannot reconcile these figures. Can you explain to me the difference between that and your estimate of 11,00 lakhs?

A.—The 11 crores estimate was based on the season's dredging of 1924-25, as they were the only figures we had to go upon. We were ordered to prepare an estimate on that basis. The whole of the work was to be carried out under that 11 crores estimate.

Q.—Is this 927 lakhs a revision of the 11 crores estimate?

A.—Yes, that would be a revision.

Q.—What is this based on?—Why is it so much less?

A.—The difference is 2 crores, *i.e.*, 1½ millions sterling.

Q.—One gets nauseate with these figures. You are putting Government in an awkward position. One month you are giving the cost as 9,27 lakhs; shortly afterwards you are giving the cost as 11 crores?

A.—It was all based on certain figures.

Q.—Then it is not the Engineer's estimate?

A.—It is not. It was a very pessimistic view; it was based on the season's dredging which we knew could be improved upon. I do not call that an estimate (the 11 crores) although we had to put up that figure.

Q.—Who wanted it to be put up?

A.—That was prepared by the Advisory Committee.

Q.—I do not think they would see the ghosts of the 11 crores estimate. Have you got a copy of the project estimates of May 1922?

A.—Yes.

Q.—It is given there "Designing, estimating and building have all had to be carried on simultaneously". Can you tell us why they have to be carried on simultaneously?

A.—I think we were designing the construction work of the walls.

Q.—The work commenced in January 1921?

A.—It was begun in October 1921.

Q.—So, from January to October, you were designing?

A.—The engineer was preparing the lay out.

Q.—Surely that is done before the plant has come?

A.—I do not know. The plant was ordered in October 1920.

Q.—Surely, they had working arrangements all set in before then? At this time, apparently it was decided to do away with the 20 ton concrete blocks, why was that?

A.—I think they found that the heavy blocks were not required; they came to the conclusion that blocks of 3 to 7 tons would be a sufficient weight to add for protection.

Q.—Surely in designing a work of this kind you would consider that before you design anything?

A.—I should.

Q.—What you think would happen to a contractors' agent?

A.—He will be sacked at once. As regards the estimate, it was prepared for the purpose of handing in to the Legislative Council. This estimate was specially got up to compare the works done up to date and to show which works were under the estimate and which works would be over the estimates, showing that the excess was entirely due to the dredging.

Q.—Mr. Lewis made this project estimate?

A.—Yes.

Q.—Has that the slightest relation to the check of the cost of the work?

A.—It has been remarkably close in the figures in such work as has been carried out excepting the figures for the dredging.

Q.—I do not understand you. If you were asking a man to make an estimate for doing a certain work, would you place any value on that estimate if you employ the same man to carry it out?

A.—It depends on who the man is.

Q.—Right. But supposing you are to make an estimate to Government to carry out certain work and you were asked to give an estimate of what you thought it would cost, what would be your inclination?

A.—To be on the safe side.

Q.—To make it higher?

A.—Yes.

Q.—So that the actual estimate of costs would really be of little value, because the Government would judge if you are going to carry it out departmentally on the nearness of the estimate to actual cost?

A.—Yes.

Q.—Therefore if your original estimate was twice as much as it ought to be, or the cost was twice as much, no blame would attach to you?

A.—No.

Q.—That is the logical conclusion?

A.—I see your point.

Q.—The fact that you have done on the lowest estimate does not prove that the estimate was a correct one or the proper cost of the work?

A.—No, Sir.

Q.—Did not you ultimately order another 100 20-ton wagons?

A.—Yes.

Q.—Do you know why that was so?

A.—Because we were short of rolling stock.

Sir F. Hopkinson.—100 is nearly 50 per cent. of the original contract?

A.—Yes.

Q.—They cost about £600 per wagon?

A.—We have about 438.

Q.—That means additional £60,000.

A.—Yes.

Q.—Was there any alteration in the scheme requiring 50 per cent. more of wagon?

A.—I believe the firm had increased the quarry output to begin the wall at both ends.

Q.—They didn't provide sufficient allowance to deal with the progress of the estimate?

A.—No.

Q.—Therefore, there was a lump jump to £60,000?

A.—Yes.

Q.—You would not call that a good estimate? Would you?

A.—No.

Q.—In the project estimate of May 1922 it is estimated that the dredging would be 5 annas a cubic yard?

A.—Yes.

Q.—Last year, what did it cost in Back Bay?

A.—It was 1·20 rupee.

Q.—That is 18 annas?

A.—No, it was 20 annas.

Q.—That is 4 times as much?

A.—That was last year.

Q.—The best year?

A.—That was not a normal season.

Q.—It was all the dredging you did, no more?

A.—Yes, but we will do better in the future.

Q.—What does the cost include?

A.—We allow for the maintenance of the plant, ...

Q.—In these costs?

A.—Yes, in these costs.

Q.—And superintendence, staff ... ?

A.—It has all the supervision, but establishment charges are not included.

Q.—What is the percentage?

A.—Allowing for all establishment and directorate, 13½ per cent.

Q.—That is rather high. Are there any reasons why the dredging in the Harbour should be either less or more than it previously obtained in its original position, unless,

of course, it leaks away? Would not you expect that the dredging would make a slightly increased bulk in the silt?

A.—No; it would eventually shrink.

Q.—Is it not the fact that you cannot move anything without increasing its bulk?

A.—That is on dry land.

Q.—If you evaporate that water what will be your output in the same position?

A.—It will have to be brought on to dry land where it will shrink. It will shrink in bulk after you dredge it and put it on shore.

Q.—But not shrink before you touch it?

A.—It would. We took a bucket of that material. We got a solid slab out of the bucket itself. There were tests made by the Resident Engineer to see what percentage of water there was. The result was 50 per cent. of water.

Q.—To what extent did it shrink?

A.—I forget what the actual shrinkage was.

Q.—Sir George Buchanan makes a complaint and says that he has been struggling against extravagance and inefficiency of this undertaking. Has he ever complained to you of extravagance?

A.—Not to me.

Q.—Did you know of his complaint from any one?

A.—I have only seen it from correspondence to the *Times*.

Q.—Have you ever been accused of inefficiency by Sir George Buchanan?

A.—No.

Q.—Has he ever complained to you of the general inefficiency with which the works were being carried on?

A.—No.

Q.—Did he state anything to the contrary?

A.—Not to my knowledge.

Q.—Has he ever complained and said that the staff were carrying on the works inefficiently? Has he ever said it?

A.—No.

Q.—He has never given you a pat on the back and said "this is very good"? Did he give any praise?

A.—Yes, he has. He has never made any complaint except in regard to certain minor works—about the construction of the work.

Q.—Here and there there have been letters complaining about the purchase and the quantity of plant and machinery?

A.—Yes.

Q.—Much of which has never been used?

A.—Yes. There were two or three items: one of them was the concrete skips which were originally ordered. They were ordered by Mr. Lewis. Another was a motor trolley for the railway. We used it, or rather Mr. Lewis could make it go, but nobody else could. That is all. All the rest of the plant has been used, I know.

Q.—I see in the same letter, Sir George Buchanan states that the Government should let the work out for contract. Do you think, from your knowledge of contractors, that any responsible man would take a contract for completing this work under present conditions?

A.—I dont think so.

Q.—I mean at any reasonable price?

A.—No, Sir. There are too many risks.

Q.—With that exception you would not call it risky?

A.—No. But the dredging is risky.

Q.—That is the only thing?

A.—The others are all straight-ahead work.

Q.—Is it not a fact that if anything has gone wrong with the provision of plant, the control and conduct of the works out here, it is to be attributed in the end entirely to Sir George Buchanan? Wasn't he the Chief Engineer in direct control of the whole scheme?

A.—Yes.

Q.—Therefore, if there is anything wrong should he not take the responsibility?

A.—I think he ought to, because he called himself the Engineer responsible for the work.

Q.—Everything you did was subject to his control?

A.—Yes.

Q.—If he wants to make any alteration you will have to carry it out?
A.—There is a certain amount of freedom.

Q.—In minor works?
A.—Yes. In major works we will have to consult him. He fixed up the working programme.

Q.—Again, he fixed the quantity of plant?
A.—Yes.

Q.—In fact, he is just in the position of a contractor and the Chief Engineer is in the position of a contractor's agent?
A.—Quite so.

Q.—If a contractor tells you to do a work, as his agent you are responsible for carrying on the work only as he has ordered you?
A.—Yes.

The Committee assembled at 11 a.m. on the 16th August 1926, all the Members being present, and examined Rao Bahadur G. K. Chitale.

15th Witness

Rao Bahadur G. K. Chitale of Ahmednagar

Written Note of Evidence of Rao Bahadur G. K. Chitale

1. Back Bay reclamation is said to have been a very old idea. It was started as far back as 1865 then from time to time the idea was revised and in 1897 a Committee was appointed for that purpose. Again in 1908 the matter was further considered and so on till ultimately the present scheme fructified and the idea now is to reclaim the sea area from Colaba point upto the old existing wall at the Kennedy sea face.

2. This reclamation scheme was estimated to cost about 375 lacs or roughly four crores of rupees and was expected to reclaim a little over 1,100 acres of land. The estimate for tools and plants was rather a heavy item of expenditure and came to a little over 30 per cent. with prospects of depreciation to a large extent. The scheme was to be worked by the Development Directorate under the supervision of Messrs. Meik Buchanan & Co., as Consulting Engineers. The staff was recruited, but mostly consisted of outsiders who did not appear to know local conditions. A special Audit Officer from the Government of India was expected to keep his watch on the expenditure, etc., by means of pre-audit and the local advisory Committee was expected to give advice on matters in connection with the scheme, but the Government was not bound to accept it. The whole Department was in the hands of an Executive Councillor who was an eminent Counsel of the Bar and the highly paid Director who was previously the Agent of the G. I. P. Railway.

3. The work was started under a glowing report, and it was expected that the reclaimed area would cost a little over Rs. 10 per square yard and in anticipation of this about a third portion of the whole reclaimed area was contracted to be sold to the Military Department at the rate of Rs. 20 per square yard.

4. Such was the ambitious scheme that was sanctioned before the reformed Council began to function. I was a member of that Council from 1921 to 1924. I was new to the work. At the first budget meeting the grant demanded for the Development Department was passed without any discussion worth the name. But still on the facts as they were presented to us we thought that the scheme was in safe hands. However in my budget speech on 20th February 1923, I alluded to this financial liability and argued that in this connexion the question of loans was a very important factor which required very careful consideration and I observed that as a very large amount was to be spent on Development of greater Bombay for which this Council was not responsible. I asked the House to consider the effect of this large commitment of 30 crores on the current revenues of the Presidency. Especially, as it was not likely to bring in any net revenue in the first ten years and I wound up by stating as my considered opinion that our financial policy must be proportionate to the length of our purse which we are able to balance from the margin of profit and as this policy was frought with very great risks especially if any scheme was unfortunately not likely to come up to the expectations, I thought it would be pledging the Revenues of our Presidency, slender as they were, and make our financial position bankrupt. However before the Council met there was an agitation carried on by contractors in order that the work should be done by contract and not departmentally. A few of the Councillors were called at a meeting convened by the contractors and as I was one of them I heard the complaints. Their point of view was that the work if done departmentally would be very costly especially as the engineering staff consisted mostly of outsiders and was not conversant with the local conditions then again our attention was drawn to heavy charges of tools and plant and the questionability of its satisfactory use with a large percentage of depreciation as most of the plant would not find buyers easily. In the light of this information I carried on my inquiries but came to the conclusion on the facts that were put before us, that as the reclamation work was highly technical it was much better left in the hands of experts who were expected to turn out better work if properly supervised. In the second year of my office I was a member of Finance Committee and was thus able to look more carefully into the question of the financial working of the scheme in my budget speech stated that one wrong step in our calculations will ruin our financial equilibrium to this there was spirited reply given by the Finance Member Honourable Sir Henry Lawrence :—

"The most important issue that has been raised is whether the loan policy of this Government is too ambitious for the revenues of the Government to bear. As an Officer who came on the scene after the main line of Bombay Development Department had been laid down ; I can claim no credit for the courage with which that policy was initiated, a policy which will mould the fortune of this great city for generations to come, but I am able to assure this House, that I have examined those projects from a detached standpoint and am filled with admiration not only for the noble proportions of the scheme and for the breadth of vision

displayed, but also for the wonderful thoroughness with which initial preparation for the successful prosecution of the scheme has been carried out. It is the scheme for the greatest transformation of any city in the world which has been undertaken since Napolean III with help of Hausmann recreated Paris. But, Sir, these dreams of a 'City Beautiful' arising in future do not visit men who are oppressed with a nightmare of impending bankruptcy and it is not my desire to beguile this House with fair words..... "

6. As the Council was responsible for this large expenditure, and as I found that Government did not allot sufficient time for the discussion in the open Council in the year 1921-22 I gave vent to the feeling of disappointment by stating openly that there was not enough time, there was a feeling in the House to allow the judgment to go by default. The argument of the Honourable Finance Member and the General Member and the glowing picture which they drew with the assured prospect of almost cent. per cent. profit, disarmed criticism and as there were not expert members in the Council I must say constructive criticism was seldom brought to bear on the discussion with the result that the scheme was allowed to be put through without public exposure of its defects. After I left the Council, facts began to prove stronger and stronger day by day with the ultimate result that even though the original estimates were trebled, there appeared no prospect of any financial gain, but on the contrary with financial ruin.

7. In the Finance Committee, I remember to have seen some statements and progress of work from time to time and I was assured that the scheme was being worked according to the estimates and scheduled time and my objection for providing interest and sinking fund charges was met by increasing estimates proportionately. I further remember to have come across one more fact namely :—A large amount was spent on certain materials for Railways in connection with the scheme, that they were lying uselessly for a long time on account of unfortunate mistakes in the indent.

8. To summarise, the causes of failure appear to be as under :—

(1) Hugeness and novelty of scheme had its own weakness.

(2) Want of experience and knowledge of local conditions in the higher Engineering staff.

(3) Want of proper and timely supervision by experts.

(4) Consulting engineers being practically away from the scene could not effectually supervise from time to time.

(5) Hush hush policy carried in the council which did not encourage intelligent and constructing criticism.

(6) Impatience of public criticism.

(7) Unconfirmed data in which dredging operations were begun and unsatisfactory working of the untrained staff.

(8) Disproportionate expenditure on tools and plant without being sure of its results.

(9) The lateness of commencing dredging operations, which were promised to be begun in December or January 1921 but which were delayed upto about October or November 1924.

(10) Want of proper effective checks and counter checks.

(11) Unsatisfactory nature of preparing estimates.

(12) Tendency of high Government officers to draw too rosy a picture of the successful nature of the scheme, without satisfactory basis.

(13) Not giving proper weight to the fact of the capitalists having already sunk, huge amounts of capital in building schemes in Bombay city and more especially in adjacent areas of Fort, Colaba, Ballard Pier estates.

(14) Depression of a trade alround.

(15) Ambition of completing the entire work Departmentally and not even entrusting some parts to contractors.

9. This is of course the criticism of a layman like me, and is therefore to be taken with limitations. As regards the question of recommending future operations I am of opinion that having regard to the fact of having sunk already very large amount of capital a satisfactory way must be found to complete as many blocks of the scheme as may be compatible with the economic financial results of the scheme.

Chairman.—You say in your statement, which you have been good enough to give us, that you were not a Member of the Council when the scheme came before them for the first time on the 3rd August 1920 ?

Rao Bahadur G. K. Chitale.—No.

Q.—You became a Member of the Legislative Council in 1921 and remained a member until 1924 ?

A.—Yes.

Q.—The first statement that you made in the Council was in March of 1921 at which time the Government believed that there would be very great profit from this scheme.

A.—Certainly.

Q.—On the 14th of March, Sir Chimanlal Setalvad had said that the scheme would make a very very big profit ?

A.—Yes.

Q.—And that was a continuation of his statement which he made on the 28th of February that on a very modest estimate a profit of at least 30 crores would accrue to the city and in circumstances might go to 50 crores. Did you accept those figures ?

A.—Yes.

Q.—Were there at that time in the Council men who did not get sufficient information to enable them to appreciate the financial possibilities ?

A.—No information was given. In fact the demand for grant was introduced and, if I remember correctly, only five minutes were left for discussion.

Q.—In your statement you say " the grant demanded for the Development Directorate was passed without any discussion worth the name. But still on the facts as they were presented to us, we thought that the scheme was in safe hands ". Were you satisfied with the discussion that was accorded to the demand for grant ?

A.—As I have said, there was no time left for discussion because, when the demand for grant was introduced by the Honourable the General Member, guillotine was applied after ten minutes.

Q.—Was your principal objection at that time that the scheme was not for the benefit of the masses but was primarily for the classes ?

A.—That was so.

Q.—And to that objection, did Sir Chimanlal Setalvad say " that Rao Bahadur Chitale will remember that 30 crores of rupees, the profit that will be realised out of the land that will be reclaimed, will be available for ameliorating the conditions of the poor classes ?"

A.—That is how he met my argument.

Q.—That statement was of course made in the hearing of all the Members of the Legislative Council who were present ?

A.—Certainly.

Q.—And as you have told us, in the absence of information, accepted ?

A.—Yes.

Q.—In 1922-23 were you a member of the Finance Committee ?

A.—Yes, I was.

Q.—Did you state that " one wrong step in your calculations would ruin the financial equilibrium ?"

A.—Yes.

Q.—In 1922-23 what was the condition of the finances of the Bombay Presidency ?

A.—Ever since the year 1921, the finances were very bad and we were not able to make both ends meet and we had recourse to taxation.

Q.—Are the conditions of life throughout India as regards the poorer classes bad ?

A.—As far as our Presidency is concerned, that is true. I argued like that because we wanted more money for the masses both for the primary education scheme and other schemes.

Q.—In reply to your word of caution that one wrong step in the calculations would ruin the financial equilibrium, did Sir Henry Lawrence reply thus :—

> " The most important issue that has been raised is whether the loan policy of this Government is too ambitious for the revenues of the Government to bear. As an officer who came on the scene after the main line of Bombay Development Department had been laid down, I can claim no credit for the courage with which that policy was initiated, a policy which will mould the fortune of this great city for generations to come but I am able to assure this House that I have examined those projects from a detached standpoint and am filled with admiration for the noble proportions of the scheme and for the breadth of vision displayed but also for the wonderful thoroughness with which initial preparation for the successful prosecution of the scheme has been carried out ".

Is Sir Henry Lawrence an expert engineer ?

A.—No.

Q.—Are you able to say what information he had before him which made him tell the house that the initial preparations had been carried out with wonderful thoroughness ?

A.—I am not aware of it. He did not give us any information on that.

Q.—Can you suggest anybody who can lead us to ascertain what was the wonderful thoroughness with which the initial preparations were carried out ?

A.—Excepting His Excellency I cannot suggest anybody.

Q.—By His Excellency you mean Sir George Lloyd ?

A.—Yes.

Q.—Again in the year 1921-22 you stated that there was not enough time given for discussion of the demand ?

A.—There were 25 minutes for discussion.

Q.—And did you add-in your speech that there was a feeling in the house to allow the judgment to go by default ?

A.—That is so.

Q.—You say " the argument of the Honourable the Finance Member and the Honourable the General Member "..... Who was then the Finance Member ?

A.—Sir Henry Lawrence.

Q.—And the General Member ?

A.—Sir Chimanlal Setalvad.

Q.— "And the glowing picture which they drew that the assured profit of almost cent. per cent. profit disarmed criticism "?

A.—That is so. " Of almost of cent. per cent. profit " is the other way of putting the statement of Sir Chimanlal Setalvad because I did not believe in that figure of 30 crores.

Q.—You are in fact saying " the glowing picture which they drew of almost cent. per cent. profit". In fact the picture that was drawn was that for an expenditure that would not exceed four crores on this rate, 30 crores of profit was a most reasonable expectation ?

A—My impression is that he meant that profit on the whole Development Scheme.

Q.—On the 25th of February 1921, Sir Chimanlal said : " Taking the estimate and expenditure on it, the cost per square yard works out to about Rs. 10·15." Is not that clear reference to the Reclamation Scheme ?

A.—Yes.

Q.— " Now taking the present values of land in the city on a very modest estimate the result of reclamation would be a profit of at least 30 crores of rupees to the city." So there he was dealing, for the moment, with reclamation and nothing else and to that he attributed a profit of 30 crores ?

A.—Yes.

Q.—Am I right that almost cent. per cent. profit is a most modest under estimate ? In fact it was going to be 750 per cent.

A.—Yes.

Q.— " In the Finance Committee I remember to have seen some statement of progress of work from time to time and I was assured that the scheme was being worked according to the estimates and scheduled time." Who assured you ?

A.—The late Mr. Mead who was then the Chief Secretary.

Q.—" My objection for providing interest and sinking fund charges was met by increasing estimates proportionately ?"

A.—Yes.

Q.—The first estimate was 3,67 lacs, the next estimate was 7,02 lacs. Was there any third estimate ?

A.—Before that 7,02 lacs was come to, my objection had been all along that in a huge work of this kind which would require years for completion, the original estimate of capital expenditure is not the total capital expenditure but the total capital expenditure on productive works would be the estimated amount plus the interest that will have to be paid on the capital spent for the period until the work is completed.

Q.—The estimate of 7,02 lacs had been drafted out ?

A.—That was not put before the Finance Committee.

Q.—What I am trying to get at is, what were the estimates which were proportionately increased ?

A.—That is what Mr. Mead showed me in answer to my objection. He showed me that he was working out figures which would allow for interest and sinking fund even though the amount is being spent from loan funds. The position was thus : This loan was floated in the Bombay Presidency and was intended to be met by the Bombay Government by a loan which it was expected to float and as a matter of fact the loan was floated, if I remember rightly, at 6½ per cent. and about 9 crores were collected. Afterwards when additional amounts were needed, I think, for the development scheme, a question arose in the Finance Committee whether the Bombay Government will be justified in floating a separate loan under the financial strain which was then existing in the whole country and we were told that the Government of India had agreed to give the necessary amount which the Bombay Government may need from their loan which they were themselves floating. And in order that there may be no competition between the loans from the public, the Finance Committee agreed and the Bombay Government drew upon the amount from the Government of India from time to time.

Q.—Do you know of any other estimate that was made in 1922–23?

A.—Apart from the then estimate of 702 lakhs which was spoken of as 8 crores, my impression is that the estimate that was shown to me came to about 5 crores.

Q.—Can you fix the date of that at all? It is very important because you see in September 1921 Sir George Lloyd had definitely given to Indian Merchants Chamber of Commerce the figure of 702 lakhs.

A.—If I remember rightly, the first Finance Committee was elected in 1921 because there was no Finance Committee before that and as I had taken up that point in the initial stage of the discussion and as Mr. Mead wanted to assure me, I remember to have seen some figures while the Council lasted till March 1921, from which I gathered an impression that the estimate was increased to about 5 crores.

Q.—Of course it is possible that the estimate of 702 lakhs did in fact, as you suggest, contain some overloading of the actual expenditure which was necessary in order to provide for interest and sinking fund charges?

A.—Yes.

Q.—If that be so, the Department ought not to take credit to themselves for having, as regards the building of the sea wall, kept within the estimated figures. In the figures of estimate for building the sea wall if there was a percentage for interest and some for sinking charges, the Development Directorate ought not to take credit and say we have constructed our sea wall within the figures which we estimated?

A.—I have not understood it. I was shown a statement which showed that the sea wall was being built within the estimated expenditure provided for in the estimates.

Q.—And this statement did include in your opinion, interest and standing charges?

A.—I am not sure of that.

Q.—At the close of your statement you say, "as regards the question of recommending future operations I am of opinion that having regard to the fact of having sunk already a very large amount of capital, a satisfactory way must be found to complete as many blocks of this scheme as may be compatible with the economic financial results of the scheme". You say that a satisfactory way must be found and I am going to ask you if you can help us to find that out. Block 8, as we know, is completed and will pass to the military under the arrangement by which they will pay approximately Rs. 20 per square yard. The suggestion has been that blocks 1 and 2 should be completed, also a suggestion that blocks 1 and 7 should be completed, and the further suggestion that blocks 1, 2 and 7 might be completed. Would the rentals that one could obtain from reclaiming land in block 7 compare at all with the rentals that might be obtained from blocks 1 and 2?

A.—No, Sir. They will differ widely.

Q.—Let us assume for a moment that you complete blocks 1, 2 and 7. Then you have got a sea wall with a 1,800-foot gap. That you say should be completed?

A.—Yes.

Q.—If you complete that you have shut in an area of sea, and at present the uncompleted work has been spoken of with objection as an eyesore. This is not an untrue description of it at the moment, is it?

A.—No.

Q.—There are some very lovely houses on Malabar Hill, are there not?

A.—Yes, Sir.

Q.—Houses built in harmony with their surroundings, set in beautiful grounds with flowering trees, flowering shrubs, houses that are a great joy to look at even from the outside. When they were half-built they must have been a great eyesore to people anywhere about?

A.—True.

Q.—Is there any reason to doubt that the architects who designed those houses and laid out the grounds could have designed something with regard to the enclosed area of sea which would be appropriate and indeed beautiful?

A.—Yes.

Q.—And whilst at the present if you shut in the area of sea you would have something that would look very ugly; in the course of a few months you would have vegetation surrounding it?

A.—Yes.

Q.—If you shut in the sea wall completely you could have a marine drive all along the face of the sea?

A.—Yes.

Q.—And would it not be possible by making culverts in the sea wall always to keep the sea inside the area sweet? Ordinarily the sea inside the area would rise as the tide rose and fall as it fell. Bombay is a city that takes a great interest in sport. Does it not?

A.—Yes.

Q.—Football, cricket?

A.—Every sport.

Q.—Have you been to England?

A.—No, Sir.

Q.—Well, you know that rowing is one of the great sports in England?

A.—Yes.

Q.—And it is a sport that can be, and is, enjoyed by thousands of men of very limited means. Young men serving in shops join rowing clubs. And not merely to young men serving in shops, to actual artisans rowing is an exercise, and a sport in England for every class. If you had culverts you could have adjustable valves by which at any moment you could keep the level of your inland lake perfectly smooth. You could also have small boats sailing, and if the depth all around it were carefully adjusted, thousands and thousands of children could go and play there in perfect safety.

A.—Yes.

Q.—There is in London a pond called the "Round Pond" at Kensington where little children from four, five and six years of age of the poorest classes are playing all day. Then if later on financial conditions improved and if there was a definite and well considered demand for more land you might take off an area of that inland lake and fill it possibly by dry filling?

A.—Yes.

Q.—Does that seem to you an extravagant proposition or one capable of being carried out?

A.—It is quite capable of being carried out, but that would however require immense patience.

Q.—What do you mean by "immense patience"?

A.—At this moment I am thinking of this. The whole scheme is now an eyesore. It is very badly commented upon and it will take a very long time before all the defects are removed from the public mind. The public are naturally criticising that the expenditure that has been made so far was perhaps meant for military purposes inasmuch as block No. 8 is finished and is to be handed over to the Military Department. They are not sure whether the other blocks would be filled up on account of the very prominent defects that are now pointed out. Also there are, I might add, large vested capital interests in the whole area consisting of the Fort and Colaba which from the very beginning are considered to be competitors for this particular area, as it is rightly supposed that the rental values of the property in Fort and Colaba or round about the area to be reclaimed will fall considerably, as that area would lose the sea air and the area that is to be reclaimed will certainly gain preference. Under those circumstances I would be prepared for a fight between capitalist landlords who alone can put capital in that area and poor people, and my other objection is that as the landlords have already sunk a very large amount elsewhere I am not sure whether we will have ready buyers for the areas if they are to be completed at a fanciful price.

Q.—The position however is that if a decision were arrived at to abandon the whole thing in its entirety, with the exception of block 8, there must be a grievous financial loss?

A.—Certainly.

Q.—Have you got an approximate figure that you can give me for that?

A.—I understand that about 5 crores have been spent so far on this estate.

Q.—Well then, except for the money that is to be paid by the Military, 239 lakhs, the rest of the money, if the scheme is wholly abandoned, would be thrown into the sea?

A.—That is so. That is the present position.

Q.—Is it not even worse than that, because what is going to happen to the sea wall? Are you going to blast it or blow it up; and even so, will not parts of it be visible at low tide? So notwithstanding the criticisms that you have made, you are of opinion that if possible a satisfactory way should be found to complete as many blocks as possible?

A.—Certainly.

Q.—The decision has really to be come to on a balance of expediency?

A.—Yes, certainly.

Q.—If it is possible to complete blocks 1 and 2, if it is possible to do something that will render the unreclaimed area useful and beautiful at a reasonable price, it is a scheme that might be considered?

A.—Yes.

Q.—At page 4 of your Statement you say, "The causes of failure appear to be as under:—

(1) Hugeness and novelty of scheme had its own weakness."

Would you explain that a little more?

A.—What I meant was that a work of this nature was never undertaken before, and the previous history of 1865 was a reminder that the amounts that were intended to be spent on such

schemes were doomed to failure. As far as local conditions went, we had not the requisite expert knowledge to run the scheme through. Not only that, but we had not also competent critics who would be useful to us in exposing the defects from time to time. What impressed the people most was the hugeness of the undertaking, and especially as that undertaking appeared to the general public rather risky. Such a scheme as they saw was a novel scheme which was not undertaken previously, and had its own weakness because there are many factors which would lead us to miscalculations even though made honestly.

Q.—You speak of want of experience in the higher engineering staff. To whom do you refer ?

A.—There was a complaint that the whole engineering staff of the Development Department was not recruited from the trained engineers of the Public Works Department who were in India, who knew the local conditions, but most of them were imported from abroad and who had absolutely no knowledge as to where the concrete or metal was to be obtained or moorum to be obtained. That was the complaint of the contractors.

Q.—But had you any person in your mind when you spoke of want of experience of the higher engineering staff ?

A.—No, I had no knowledge of the higher officers. I meant the engineering staff down below.

Q.—You then say the " Consulting engineers being practically away from the scene could not effectually supervise from time to time " ? Whom are you referring to when you use the words " Consulting engineers ".

A.—I meant Messrs. Meik & Buchanan.

Q.—When were they ever made Consulting Engineers ?

A.—I thought they were.

Q.—The contract we will have to construe for ourselves, but time and time again on the correspondence Sir George Buchanan has taken up the position, " We were the actual responsible Engineers for the carrying out of the work ". That you see puts a much greater responsibility on Sir George Buchanan. That is a point we shall have to decide ourselves as to what was the legal position of the firm of Meik & Buchanan towards the Government. But if they were in fact the actual responsible Engineers who had agreed to undertake and carry out the work, your criticism applies with much greater force than if they were merely consulting engineers ?

A.—Yes. I raised that question in the Finance Committee. I asked for a copy of the Contract, which was not forthcoming. I requested the Chief Secretary to know what percentage they had. I was told they were to get 2 per cent. commission. Then I asked if 2 per cent. commission was to be paid, did it include also all kinds of material which were supplied by local people, for instance the metal and the moorum. I was told that his percentage would be on the total estimated amount. Then I wanted to know if the estimated amount went up he would be entitled to his 2 per cent. commission. I was told, professionally speaking he would be entitled on the corresponding ascending figure. Then I tried to get at his position, *viz.*, who were responsible for the whole scheme being completed within the estimate. Then I was told, and therefore I still think, as Consulting Engineers the whole scheme was in expert hands, *viz.*, Messrs. Meik & Buchanan, who were conversant with the kind of work, and I was further told that the Government point of view was being looked after by special audit officers, as the Government of India insisted on having altogether a separate audit from that of the Bombay Government and any deviations from the original scheme would not be easily tolerated, because it was his duty to point it out, and as throughout my three years' experience there was not a single report received from the special Audit Officer we thought everything was going on as well as one would wish.

Q.—Have you seen the Agreement between Meik & Buchanan and the Secretary of State for India ?

A.—No, it was not forthcoming when I asked for it.

Q.—I have it here. It is dated 17th March 1921, and is between the firm and the Secretary of State for India in Council. And the 1st clause says the Firm agree to act as the Engineers of the Secretary of State in carrying out the said scheme and in the construction and execution of all works connected therewith until the final completion thereof and that the Firm shall at all times assist and advise the Government of Bombay in all matters relating to the execution of the works. And then comes the important part, " and shall supervise the same and undertake and perform all works and duties devolving upon engineers of large works and in particular the following work and duties ".

A.—That puts thei liability higher than I did.

Q.—And then clause (F) says as regards the work in India, " during the whole period of execution the works shall be closely supervised by the Firm and Sir George Buchanan shall devote the greater part of his time to this particular work and shall, unless the Bombay Government shall agree otherwise, visit Bombay this year and in every year after the monsoon when the working season begins and remain in Bombay for such period during the working season as he or the Government of Bombay may consider necessary to ensure the complete and satisfactory supervision of the works and shall also if necessary in his own opinion or in the opinion

of the Government of Bombay make additional visits during any monsoon ". That fastens the responsibility on them as far as pen and paper could do it. The Secretary of State in Council was binding the firm of Meik & Buchanan and Sir George Buchanan down to supervise and execute and carry out the work and was stipulating most carefully for the personal attendance of Sir George Buchanan in India at any time during the progress and until the completion of the work.

As regards causes of failure you say as No. 9 in your statement, " The lateness of commencing dredging operations, which were promised to be begun in December or January 1921....." You mean December 1921 or January 1922 ? The report of the working of the Development Directorate for the period ending 31st March 1921 says the dredger is timed to arrive in Bombay after the monsoon of 1922 when it was expected to have a compartment of the reclamation area ready for filling.

A.—I have got it from the Council proceedings, from Sir Chimanlal's speech in the Council of 1921. December 1921 or January 1922 was my impression.

Q.—You say in your Statement, " To summarise, the causes of failure appear to be as under ": and then you say, " 14. Depression of trade all round." Now this matter that we are considering falls into two parts. A trade depression would not in any way affect the proper carrying out of the work of the reclamation scheme ?

A.—No.

Q.—That is purely a matter of being able to carry out the promises that were made at the price and within the time submitted ?

A.—Yes.

Q.—The importance of depression in trade comes in when we are considering what further work if any should be done ?

A.—But it would affect the original estimates, because it would affect the prices that the area reclaimed would fetch.

Q.—Depression in trade, you have told me, would have no effect upon the actual execution of the works ?

A.—No.

Q.—But depression in trade has a most material bearing upon the extent to which it is worth while going on with the scheme ?

A.—Yes.

Q.—If for instance the Government of Bombay had definite offers for definite areas of land which people contracted to take up when finished for Rs. 50, 60, 80 or 100 a square yard, then the matter becomes one of very much less difficulty ?

A.—Certainly.

Q.—If for instance the Government of Bombay made definite offers for definite areas of land which people contracted to take up when finished at 50, 80 or 100 rupees an acre, then the matter becomes one of very much less difficulty ? At the present moment the Advisory Committee is going into those matters with a view to instruct us as to the possibility of an ultimate reduction of loss by recoupment from the reclaimed area.

A.—Yes.

Sir M. Visvesvaraya.—Did any section of the public ask for the reclamation at the time when, or before, the scheme was sanctioned ? Was there any demand from the public ?

A.—There was no demand, but everybody, at least in Bombay, had a liking for this reclamation from time immemorial.

Q.—Why was it then that the Indian Merchants' Chamber were opposed to it at that time ?

A.—As I said, the capitalist class thought that they would be affected.

Q.—The work has got to be carried out from provincial funds ?

A.—Yes.

Q.—What was the opinion of the taxpayer generally in the Presidency ?

A.—In those good old days nobody cared for the taxpayer, except the Government.

Q.—What was the object of proceeding with this work in such a hurry ? You were in touch with public affairs then ?

A.—I might say, an ambition for the greater Bombay. Bombay was being improved all along and there was no doubt that there was not sufficient room for the people as the population has immensely increased.

Q.—Are you or are you not in favour of the completion of the work now ?

A.—I am absolutely in favour of the completion of the work.

Q.—You know the value of land on this side of the Hornby Road will go down very considerably and a number of properties will lose in value ?

A.—Bombay is such a place that nobody can say anything definitely, and if there is any city anywhere in India, I should think that this city of Bombay would be the first to make itself more beautiful.

Q.—What is your opinion of the manner in which the work has been carried on. Has it been efficient and satisfactory ?

A.—According to the report it is not satisfactory, nor is it well done.

Q.—Have you any difficulties in view and any remedies to suggest ?

A.—I might say that this was partly because the initiative and the driving power of His Excellency the Governor Sir George Lloyd has gone. If he had seen this dredger not working satisfactorily, he would not have allowed it for a day longer. Moreover the outlook has changed now ; the price of land has gone down, although there was a boom when the work was sanctioned. But even though land prices are varying now below Rs. 100, it is quite reasonable for Rs. 100 per square yard. It will fetch that on any day.

Q.—If the work is to be proceeded with, have you any changes to suggest in the administration or methods of work or in the agency by which the work is to be done ?

A.—If you can get good contractors, that would be the best.

Q.—What is your idea about the Public Works Department doing the work ?

A.—I have more faith in good contractors than in the Public Works Department, because the latter has to work under limitations which the former have not to do.

Q.—Will the public want the early completion of the scheme ?

A.—As far as I am concerned, I want it.

Sir Frederick Hopkinson.—You said a moment ago that you had more faith in good contractors than in the Public Works Department. Have you had experience of both ?

A.—I am going by what I could see for myself.

Q.—It is a considered opinion ?

A.—Yes, in this way that laymen like myself think that the work done by very good contractors is much better than work done by the Public Works Department. In the former case the work is supervised much better than is done by the Government department, and the results would be better.

Q.—Am I right in thinking that the contractors' methods are much more elastic than those of the Public Works Department ? If the contractor decides to do a thing he does it at once ?

A.—Yes.

Q.—We have a proverb in England that the shoemaker should stick to his last. Does not that equally apply in carrying out works of this kind ?

A.—Yes. Before the scheme was launched, there was a clamour that the work should be more or less completed by contract.

Q.—The people of Bombay would really have liked to see that the best firm of contractors in the world had taken up the work, and they think they would have done it in the best manner possible, and that if they had done so, the work would have been completed much earlier ?

A.—Yes, or it would have been exposed much earlier.

Q.—The firm of contractors that we are speaking of, *i.e.*, the best firm in the world, would set a value on their high reputation ?

A.—Certainly.

Q.—And if the scheme had been unfinished or had been carried out by them in the way in which it has been carried out, they would have lost considerably in reputation and presumably also in pocket ?

A.—Yes.

Q.—A contractor taking up this work would have taken it for a fixed sum. If he had taken it for 7 crores and had done it for 6 crores he would get a profit ?

A.—I am not quite sure whether in such big works it would be so.

Q.—If as I say he had taken it for 7 crores and it cost him 8 crores, he would have lost one crore. And if Government had made a proper contract, the contractor would have been bound to do it ? Therefore, if the work had cost more than 7 crores, Government would have lost nothing ?

A.—Yes.

Q.—You said something about a few minutes ago about the commission payable to the engineers, I mean fees to the consulting engineers ?

A.—Yes, I do not grudge that.

Q.—Do you think that 2 per cent. was a reasonable sum ?

A.—Yes, it was quite reasonable.

Q.—Probably when the general public hear definitely what the actual rate was, they also will agree in the same way ?

A.—Yes, I think so.

Q.—That there has been no extravagant payment to the consulting engineer ?

A.—Yes.

Q.—If the consulting engineers were capable of carrying on a work of this magnitude, you would have no objection to pay 2 per cent. ?

A.—Of course, if they had done the work properly.

Q.—Provided they were competent and had done it also properly ?

A.—Yes.

Q.—I used the wrong term just now, namely consulting engineers. Messrs. Meik & Buchanan were not consulting engineers—they were engineers controlling the whole work. So far as the control of the work was concerned, they were in an almost identical position to contractors ?

A.—Yes.

Q.—So far as the actual control and execution of the work is concerned ?

A.—Yes.

Q.—If they said that a thing ought to be done, it should be done; and Government could not possibly object to it ?

A.—In fact that was the answer that they gave me. It was that all the engineering staff had to be recruited according to the wishes of the engineers.

Q.—They were in fact appointed by the engineers ?

A.—In the main they were.

Q.—If I were to tell a man I wanted to be driven a hundred miles an hour and told him that he should use a car that could not run under any circumstances more than 20 miles an hour, that would be an unreasonable thing to do ?

A.—Yes.

Q.—And therefore a man who is going to do the work ought to have the choice of tools. If you want to drive in a ten inch spike, you would not use a watch-maker's hammer. The man who is driving should say what sort of hammer he should have ?

A.—But that is not always very desirable in such undertakings. My objection is that the firm was not residing here. They were residing in England, and even though the Government might be pleased to put their trust in Sir George Buchanan that would not be the same thing as saying that they put their trust in their agents. If they were residing here, that was another matter.

Q.—Messrs. Meik & Buchanan were in London with the obligation to come out here at least every year and spend a considerable time here ?

A.—They would not have come as frequently as one would have wished.

Q.—If Messrs. Meik & Buchanan had a man in sole charge of the works here in whom they had confidence, they would know every week exactly how their wishes and instructions were being carried out. As a matter of practice I may tell you that I have done similar works to this where I have only been twice a year ; but I have known exactly what is being done when I was not there and I knew that they were carrying out my orders, because when I first gave them their orders I had the confidence that they would be carried out. It is not necessary for an engineer to be here the whole time, but it is necessary that he should know what is going on and that his orders are being carried out ?

A.—Yes.

Mr. Billimoria.—In your notes you have expressed some doubt with regard to the financial prospects of the scheme. I shall therefore ask you a few general questions. You very well remember that, before this scheme was embarked upon, an estimate of 367 lakhs was drawn up. Had you any reason at that time, on the basis of that estimate, to doubt that the scheme would not be a profitable one ?

A.—No.

Q.—On page 2 you say that you had certain doubts and you say that you thought it would be pledging the revenues of our presidency, slender as they were, and making our financial position bankrupt. Did you fear that the scheme would not be profitable in 1923 ? Were your doubts raised that time ?

A.—Therein I was referring to the total amount of debts which had then mounted up to 44 crores which included 30 crores for greater Bombay. Working as I did, I said that an amount of 44 crores was rather a large amount when they were trying to put up taxation almost every year.

Q.—And therefore I ask you that if anything went wrong in our estimates—as a matter of fact we had here some complaints from the people, complaints at least that the work on the Back Bay was not being done quite properly—but that was outside criticism—but according to the facts that are put before us, we are not warranted in accepting the estimates ?

A.—What I said therein, however, was that as the finances of the presidency were not on quite a good footing, if one wrong step led us anywhere else with such a huge sum, it may be lost, and also our huge dreams will not be realised. It therefore behoved us to see that no wrong step crept in. As far as we were concerned we had a talk among the people.

Q.—I suppose then you had also heard that the estimate of 367 lakhs had mounted up to 702 lakhs ? An estimate of 367 lakhs was sanctioned and approved by the Government of India as well as by the Secretary of State for India. The Government of Bombay did not consult either the Government of India or the Secretary of State when the estimate was raised to 702 lakhs, because as I understand under the Reforms they were not bound to refer this matter to the Government of India ?

A.—I am surprised at that proposition, because we were told, at least at the initial stage of the scheme, that the Government of India insisted upon a vital condition of maintaining

a special audit officer who was quite independent of the local accounts office, that is, the Local Government. At least I understood from it that it would be the duty of the special audit officer to report to the Government of India, not with a view to any action, but that he would be bound to report to the Government of India any deviations from the original estimate, because it would not be quite within his powers to pass any expenditure which was not within the previous estimates. If, therefore, in 1923 that special audit officer also functioned because his appointment was made after the Reform Councils came into existence, he must have reported to the Government of India the increased estimates of cent. per cent. and it would not be quite right to say that so far the Local Government or the Local Council were free from the reins of the Government of India. That is not the constitutional position. I understood the constitutional position to be this that the Government of India as the supreme authority had every power to pull in the reins at the proper moment, and when in such a big scheme the expenditure or the revised estimate went up a hundred per cent. it would be their duty to have done it and reported the matter to us.

Q.—When you refer to that power, you mean the power of exercising control ? But under the Reforms the Local Government were not bound to go again to the Government of India and have their approval or sanction ?

A.—What I meant was that, if in the original contract or agreement the Government of India insisted on the maintenance of a special audit officer, then it would be the duty of the special audit officer to report to the Government of India that the estimates had been exceeded. I took that there must have been such a report. But as far as I know, none of his reports as to whether the expenditure was within the estimates or not, ever came before us in the Finance Committee or was ever referred to by the Finance Member. We thought that everything was within the estimate.

Q.—So you had no information that the estimate had gone up to 702 lakhs and was sanctioned by the Government of Bombay, although it was referred to in a speech by the Governor of Bombay at the Indian Merchants' Chamber ? I suppose that was the common knowledge of all the members of Council ?

A.—No, I am afraid not. Because it was a speech made at a particular meeting.

Q.—And you for one, as an honourable member of Council, were all along led to believe that the work was carried on within the estimate of 367 lakhs ?

A.—Not quite that ; I was prepared for 5 crores.

Q.—Now, Rao Bahadur, will not a business man when he launches on a scheme take into account the interest on capital and depreciation on plant and machinery that he would employ to carry out the scheme and only after taking that into account come to a conclusion that the scheme was going eventually to be profitable or otherwise ?

A.—As business men we have to see this. But as far as I remember I had asked for certain figures of the prices at the Colaba areas for vacant sites. If I remember rightly, the prices have varied between 1921 and 1923 anywhere between 300 and about 800 or 900. That being our knowledge, we were told by the Honourable the General Member that the cost per square yard would be Rs. 10. We were prepared to make some allowance and we thought that, even if it did cost us somewhere as I said below a hundred, it would be a very good business proposition. And even now I said that, if the scheme is completed, say, for 60 rupees per square yard, it would be quite a business proposition to go in for the scheme even at a larger expenditure. That is my personal view ; but having regard to the business connections and business lines, Rs. 60 per square yard in the Fort area would be quite a business proposition for the capitalists putting in their money on that site. It is a capital site quite desirable from many points of view.

Q.—You just mentioned something about the prices of land in the Fort area varying from 300 to 800. That is a very restricted area and you must be aware of that ? You do not expect to get such a huge price for residential land or land for buildings ?

Witness.—May I enquire what is your estimate of the prices there ?

Mr. Billimoria.—Not exceeding Rs. 50. That is for the first front lines.

Witness.—If my impression is correct, I think it was more.

Mr. Billimoria.—The position will be clear if we get this estimate from the Improvement Trust.

Q.—When you talk of Rs. 60 average do you suggest that it is for both residential as well as commercial quarters ?

A.—I will not venture an opinion on that.

Q.—Then in answer to a question put to you by the Chairman, you suggested something about patience. You said we must have complete patience. By patience you meant patience till the completion of the scheme because it would take some years to complete ?

A.—Yes.

Q.—Is it that the patience of the public was exhausted or of the Government ?

A.—I meant both. The patience of the public is now exhausted and anything which they would consider very proper in calmer moments is not likely to be taken up on the present basis. But if some time is allowed to elapse, and the scheme materialises I am sure public opinion will veer round, especially if the scheme is finished.

Q.—You also mean it will be more economically done ?

A.—That I am not sure of; from the past history, one ought to suspend his judgment.

Q.—To some question from the Chair, I heard you say something about the contract. You suggested that Messrs. Meik & Buchanan's contract was not forthcoming when you asked for it as a member of the Finance Committee. Did you actually call for it that it should be produced ?

A.—When this question was mooted in the Finance Committee, I just asked whether there was a copy of it ; I wanted to ascertain what the liabilities were. It was not forthcoming at the moment.

Q.—At the moment ? Had you asked for it again ?

A.—I had asked for it again. It was not forthcoming. It appeared that it was perfected on 16th March 1921.

Q.—Was any reason assigned for not producing that copy ?

A.—No reason was assigned. I was under the impression that as it was in the old council the scheme was carried the contract would be ready. But that was not so.

Q.—In reply to a question put to you by Sir Visvesvaraya, you said that the public of Bombay did demand the reclamation. Did they demand the reclamation of such a huge area as 1,145 acres ?

A.—I know that the public wanted the whole reclamation done from the Colaba point to the Malabar Hill point. But this was much smaller.

Q.—Do you think there was demand for land over such a huge area ?

A.—The Development Department and the Improvement Trust created those huge notions in men's minds.

Q.—Do you think there was any demand for such a huge area being available for reclamation ?

A.—Out of 1,145 acres, 350 were marked down for roads, then there were only 800 ; 200 of this was given to the Military department ; it was then thought that 300 acres just near the sea would be readily taken up by any capitalist; so there was only one-third remaining for reclamation.

Q.—Then you said something about the completion of the scheme. Is it that whole scheme should be completed or only a few blocks, as was pointed out to you by the Chairman when the suggestion was that Nos. 1, 2 and 7 might be completed ? Are you in favour of that or for the completion of the whole scheme ?

A.—No, No. As I said, we have already sunk a large amount and I would restrict myself to saying that block No. 7 would be economically filled up and the cost would be comparatively smaller than block 2. We cannot give up block 1 in any circumstance even if it cost a little more, and if also we can economically fill block No. 2 and leave the rest as a lake, as our Chairman pointed out, I think that would be a capital idea, and need not require also the finishing up of the whole wall.

Q.—Then you also referred to the congestion of population and so on. There is a report that is published by the Bombay Development Department, and Mr. Barucha, the Land Manager, on 16th October 1913, in one of his notes, mentions "It goes without saying that no individual or public body, no matter what their resources may be, can deal satisfactorily, single-handed, with the question of housing people living in one tenement, seeing that according to the census of 1911, out of the total population of 929,000 living in 200,000 tenements, 743,000, *i.e.*, about 80 per cent. of the total population, live in one-room tenements". This idea was hammered as far back as 1919. The extension of the greater Bombay was considered vitally necessary. But did it mean reclamation or development of the north of the Island ? People living in one-room tenements were not expected to shift on to the sea front reclaimed area : they want better land, better housing, and better accommodation in the north of the island in the vicinity of their own surroundings ?

A.—We must take the scheme as a whole and judge on its merits.

Q.—We are dealing with reclamation alone now ? Our reference is confined to the reclamation and not the whole of the development scheme ?

A.—If we take up the whole scheme, we must see that it is properly apportioned in order to meet the objection that the poor could not be placed on these. There was the greater inducement in providing about 50,000 one-room tenements, especially not far from the property on which they were to work, near the mills, etc. What appears to me (of course it may be quite justifiable from the point of view of greater Bombay) is that more money was being spent on the roads and other amenities which could have been minimised ; that is the layman's view. But taken as a whole, one cannot say that the scheme for the Back Bay would have been so appealing to the general public as it was without the reclamation, and especially, as the Government of Bombay was to raise a loan : (they cannot help that), naturally the sympathies of the rich people went for the whole scheme, and they therefore subscribed for it.

Q.—Now with regard to your answer to Sir Frederick, you said that you did not grudge any commission to the firm of contractors. Naturally no one would do it. But supposing there was an estimate on which a contract had to be entrusted, say, about 4 crores, and eventually that was doubled, would you grudge three times the commission ?

A.—I would not give him anything at all. I would terminate the contract, I would find fault with him and won't pay him. That would be the most business like way. The whole trouble was due to his neglect of duty. The 2 per cent. commission for such a big scheme was certainly low, because on the estimate, usually one's commission is 5 per cent. at least.

Q.—Would you as a prudent business man not fix a maximum while employing the engineer ?

A.—In professional matters we always go by percentage, and never put up a maximum.

Q.—If then the estimate is exceeded by three or four times ?

A.—That is taken into consideration when we fix up the lower limit. If for instance the original estimate was 4 lakhs, he would have asked for 4 per cent. commission ; I think it would be more.

Q.—If it was placed on an estimate of 4 crores, where the commission was assured up to 8 lakhs of rupees, then if it mounted up to 11 crores, do you as a business man and a lawyer think it would be justifiable if he should claim 2 per cent. on the increased amount, as emanating from an engineer ?

A.—As a lawyer, if you had sanctioned it you will have to pay it, but as a prudent business man, if it is due to his neglect of duty or responsibility, I am not quite sure of his being given 2 per cent. But as far as the first 2 per cent. is concerned, that is quite reasonable and fair.

Q.—If the estimates were drawn up, well considered and with mature experience, and it has subsequently been noticed that there have been serious defects, would you still consider that the commission would be a reasonable one ?

A.—As I understand a business proposition, the contractors or anybody else prepares the estimates. Somebody, some expert on behalf of the local Government goes through it, examines it, approves of it ; then it is looked into by the Government of India and the Secretary of State when they put their seal on the estimate. Then, the contractor is absolutely right in asking his commission on them.

Q.—But do you know whether this particular estimate was ever examined by anybody in the local Government ?

A.—Must have been.

Q.—Do you know of any person that has done it ?

A.—That is the routine procedure ; otherwise nothing of the kind could go there.

Q.—So many things are being done in the name of routine ; else there would never have been this enquiry ?

A.—I think this estimate would not have been sanctioned without the authority of the local Government or the Chief Engineer. That is my position. I have never seen an estimate of even Rs. 1,000 accepted without being looked into by a superior officer ?

Q.—So you think it was done usually ; if it was not done, it was gross negligence ?

A.—Yes ; it was gross negligence.

Q.—On page 4 of your notes, in paragraph 6, you say " After I left the Council, the facts began to prove stronger and stronger day by day, with the ultimate result, that even though the original estimates were doubled, there appeared no prospect of any financial gain, but on the contrary financial ruin." How did you come to that conclusion ? Had you any data or was it from what you have heard that you arrived at that conclusion ?

A.—What I would say is this ; that a programme of 50,000 one-room tenements has been cut down after a lot of money has been spent on road improvements and other things. The area that was marked for commercial enterprise, in other places, that has also been restricted, though a lot of expenditure has been incurred. This Back Bay estimate has been doubled, and as I said—I speak subject to correction—the whole is now expected to cost 11 crores or somewhere between 11 and 12 crores, out of which 8 crores are for the Back Bay, which may fructify or may not. The present rental value of the one-room tenements which should be taken into consideration first has gone down considerably, at least by 50 per cent. as far as I can see. Most of the one-room tenements are not taken up by the people. These are facts which lead me to say that the whole expenditure would not only bring us nothing but would land us in financial ruin, because it would not fructify.

Q.—That is your conclusion ? In the next paragraph, you say " A large amount was spent on certain materials for railways in connexion with the scheme and that they were lying uselessly for a long time on account of the unfortunate mistakes in the indent. Do you refer to the Back Bay or some other scheme ?

A.—I refer to the Back Bay.

Q.—Can you give us some instances, if they are within your knowledge as to the mistake in the indents, of which you have just mentioned, in which materials were lying for a long time ?

A.—I have got that particular instance in mind. It is this. Some railway materials were intended for linking up the Back Bay system with B.B.C.I. main line. The report then went

up that in spite of the indent for the necessary material, that would fit in only for 5′·8″ gauge. This was an unfortunate mistake, and everything was brought in which would not suit the purpose. I remember putting a question in the Finance Committee, and the answer was in the affirmative, that there was a mistake of that kind, with the result that with the materials the railways could not be built at once and it took some time. That was the report that went up. I said there was some mistake, and what particular mistake there was I have told you. It was in connection with this.

Q.—We will take up that question later. But can you tell us what that cost the department ? It must be a question of several lakhs ?

A.—It is a question of 3 or 4 lakhs.

Q.—Then you mention "Want of proper and timely supervision by experts." May I clearly understand what you wish to imply by that remark ?

A.—As I told you already, I understand that the whole of the engineering staff had to be recruited according to the wishes of Messrs. Meik & Buchanan, and therefore the Public Works Department was ignored altogether. At least that was the complaint of the Public Works Department then. The local Government had made itself responsible for the scheme, and I think it would be a good business proposition to suggest that when the staff has been recruited by Messrs. Meik & Buchanan and supervised by them, the local Government would employ some higher officers of their own to look into the matter from time to time and supervise them effectively. It is not one item but several items ; not only do we audit whether particular items agree with the voucher or not, but also see whether there are any defects in the scheme and the estimates. I found, as far as the Finance Committee of the Council was concerned, that there was no control of that kind, and therefore I say that if that had looked into it from time to time, they could have avoided the mistakes. Of course it is not so easy a thing, because even though an estimate may be made, unless you go up to the end of it, you cannot say whether you are exceeding it or not, because it is a total amount ; but as the local Government has made itself responsible and as the honourable the Finance Member was assuring us that everything was going on merrily, I thought it natural that the local Government had looked into it, and with the driving power of Sir George Lloyd I thought that we were absolutely in safe hands, and therefore also I opposed in the Council the transfer of the department to a minister. I said it was much better that the department be under the control of an Executive Councillor than a Minister. Because the proposition was moved in the Council and I voted against it.

Q.—What allowance would you make for excess in the estimate ? 10 or 20 per cent.?

A.—Not more than 10 per cent. including 5 per cent. for contingencies.

Q.—In your concluding paragraph you say "hush hush policy in the Council." Do you suggest by that that the public were not taken into confidence ?

A.—What I meant was this, that in the discussion on the budget there were only two or three items of big expenditure, for instance, this Development department, the Irrigation department. These were the only original schemes and these were other items of expenditure on which we might differ in details. My first complaint was that this should be referred to the Council at the last moment of the guillotine. Usually the business in the Council was so arranged that they were taken up almost at the end of the council sessions. Other grants were introduced and they went up. In the first council we had only 5 minutes left, in the second council 25 minutes left, in the third council we had a couple of hours. Then again when there was any remark made or information asked for in the Finance Committee we were assured by the officers concerned that everything was going on all right ; and even if the scheme was bad financially, we were told "we have been looking into it from beginning to end, and we are satisfied." In these circumstances, I called it a hush hush policy. In a matter of this moment they should have taken the Council into their fullest confidence ; they should have moved their estimates and the grants or demands for grants earlier in the session when we had about 10 days to vote upon. As they did not do it, I called it a hush hush policy ; because it was the full council that could bring any responsibility to the proper quarters and fix it.

Q.—You mentioned something about Officers. Will you kindly mention any names ?

A.—Sir Henry Lawrence, Finance Member, who watches the financial part of the proceedings and the Honourable General Member.

Chairman.—Sir Chimanlal Setalvad ?

A.—Yes.

Mr. Billimoria.—Any other names ?

A.—Sir Lawless Hepper, who was a member of the Council.

Q.—Anybody else ?

A.—And the Financial Secretary. He never spoke anything in the Council openly.

Q.—These were the three big officers you referred to ?

A.—Yes.

Q.—Can you tell me who was responsible for placing these items before the Council, how is it only 5 minutes or 25 minutes or a couple of hours were allotted, who is responsible for it, the Council or any particular official ?

A.—Oh no, it is only the Government that is responsible.

Q.—They gave you no time ?

A.—Yes, it is the Government that are responsible for it.

Q.—Could not you ask for more time ?

A.—No, we could not.

Q.—So that you complain that you had no opportunity to discuss an important matter like this ?

A.—Yes.

Q.—Did you point out your grievance in writing or in other ways ?

A.—I have said so in my speech that the judgment of the House was to allow the grant to go by default.

Q.—Did you raise that objection, did you.....?

A.—According to the constitutional procedure it is the Leader of the House and the Executive Councillors who are responsible for asking that their demands for grants might be taken up in the order they liked from day to day. It is they who are responsible for introducing them as there are only 10 days allotted for the consideration of the grants. They could have introduced the demand even on the first day,—because in the last council they did introduce it much earlier,—but we could not have asked for this order.

Q.—But if members of Council devote much of their time to matters which are of much less importance, and if on account of that vital questions are left out to the last moment, do you think Government is responsible for it ?

A.—They know exactly their position and therefore they should be responsible. They ought not to take advantage of the Councillors spending their time uselessly, as you put it.

Q.—I did not put it like that.

A.—It is their duty to introduce items of big expenditure and explain matters to the Council. Nothing could have been lost if the Government introduced a demand earlier.

Q.—I quite agree with you. Supposing a longer time was allotted.....

A.—I am not sure, at least the public would have been satisfied ; there would have been no room for complaint. On the other hand, if they had introduced it much earlier, we might have looked into it more carefully.

Q.—Then you refer to the unsatisfactory nature of preparing the estimates ?

A.—Yes.

Q.—Has the estimate gone wrong ? You made a complaint.

A.—While the Council was going on, we found that certain provisions were asked for without the estimates forthcoming. If I remember rightly, some one of us proposed a cut of so many rupees, and there was a discussion. If I remember rightly, there was a remark by the Auditor General or somebody from the Accountant-General's office that the original estimates were not met within the grant. One item I do remember : Kirol Road Widening Scheme or something which was discussed in open Council. No estimates were forthcoming and we were told in reply that as this was a budget discussion, budget grant should be voted, and that the estimates would be coming in afterwards. We said it was not a correct procedure, that the estimates must be there, and that if the estimates were not ready the Government ought to wait until we looked into it. To say that the estimates were not ready and to ask for a grant is in itself wrong.

Q.—You said something about the Auditor-General. Do you know of any instance of the Auditor-General complaining ?

A.—Not that. I meant the first report of the Accountant General that we had after the Department or rather the Government had sanctioned the estimate. There were certain items of expenditure to which there was no sanction.

Q.—The amount was spent without sanction ?

A.—Without proper estimate. That was prior to our coming to Council. You find at page 1053, the Volume for 1923 of the Accountant-General's Report, where the Accountant-General refers to the fact of certain City Schemes and Suburban Schemes without estimates being sanctioned. The project estimates for 8 schemes have been sanctioned ; and on the 8 schemes considered to be financially unsound, expenditure was incurred. That was the position in 1921.

Q.—In your conclusion you say that a satisfactory way must be found to complete as many blocks of the scheme as may be compatible with the economic, financial results of the scheme. Have you anything further to add to your reply to the Chairman in answer to the query as to now you want the whole scheme to be completed, whether you will go slowly, cautiously and carefully ? You said that work might be commenced in blocks 1 and 7 and then think of any further development.

A.—I have put it as economically as possible. If block 8 is completed we would get about Rs. 2·39 lakhs. I would have no objection if work in block 7 or 1 is taken in hand. As the Chairman assured me that the matter is being looked into as to the amount which these lands will fetch, if let out for contract, it would give the answer to the query. I cannot therefore say the time when this completion will fructify. The whole work should be done by

contract and not departmentally. If it is possible to have the whole scheme completed I would have no objection.

The examination of Rao Bahadur G. K. Chitale concluded.

16th Witness

Mr. C. W.E. Arbuthnot, Executive Engineer

Mr. C. W. E. Arbuthnot, Executive Engineer, Bombay Presidency Division, was examined.

Chairman.—What is your Christian name ?

A.—Clifford William Ernest.

Sir M. Visvesvaraya wants to ask you some technical questions at first.

Sir M. Visvesvaraya.—You were a member of Mr. Neilson's Committee ?

A.—Yes.

Q.—For how many months did you carry on your investigations on that Committee ?

A.—I think about three months altogether. But for the first month we had not received the estimates, and so we didn't hold many meetings. I have not got the exact date of the first meeting.

Q.—You have found out what it would cost to do the filling in future, isn't that so ?

A.—Yes.

Q.—Can you give us what the rates are likely to be for dredged filling and moorum filling respectively as a result of your investigations ?

A.—The rates have been reported to Government in the report of the Committee. The cost of the consolidated filling worked out at 11·88 annas per cubic yard and that rate is being adopted for the estimate for block 7. That was for dredged filling. For moorum filling the rate has worked out to Rs. 2·14 per cubic yard.

Q.—Have you got the details for the Rs. 2·14 per cubic yard rate ? How did you arrive at that rate ?

A.—For the moorum filling we were given figures of actual cost by the Development Department.

Sir Frederick Hopkinson.—Are you quoting from that document ? (He showed a document to Mr. Arbuthnot).

A.—Yes.

Q.—Did you work out the details ?

A.—We had the details before us.

Q.—I consider that the rate for moorum delivered at site would be about Rs. 1·3. You have got your report with you, I suppose ?

A.—Yes.

Q.—Turn to the second page, about harbour dredging, you will find the reason why the cost of moorum filling has been taken by the Bombay Development Department at Rs. 4·92 per brass. The actual words are "and this figure can be adhered to except that 15 per cent. should be allowed for " etc. There seems to be some mistake in that, the rate per cubic yard should be Rs. 1·56.

Q.—Did Mr. Neilson point that out to you ?

A.—No, Sir. There is some arithmetical miscalculation.

Sir M. Visvesvaraya.—Can you say what the rate is per cubic yard, from your experience, of moorum filling in Bombay generally ? You are the Executive Engineer, Bombay Presidency District ?

A.—Yes. I could not say off-hand.

Q.—From your daily experience on work, what is it per brass ?

A.—I think it is about Rs. 3 per brass for dry filling.

Q.—Are you quite sure of that ?

A.—No, I am not quite sure, but I think approximately it is so.

Q.—What we want to know is, from your experience of the moorum filling, whether you thought that 1·56 was the proper rate at which you could get moorum filling done ?

A.—I think it is a reasonable rate for such a large quantity of filling as has to be brought by the Development Department for this work.

Q.—1·56 is the rate at which the Engineers of the Development Department calculate ?

A.—No ; it is after allowing 15 per cent. for shrinkage.

Q.—Dredged filling comes to about twelve annas for filling from the Harbour and Rs. 1·3 for filling from Back Bay ?

A.—Yes.

Q.—Would you like to proceed with the dredged filling or would you substitute moorum filling to complete the work rapidly ?

A.—I don't think the work could be completed rapidly by using only moorum filling.

Q.—Can you tell us as a result of your recent investigation what the rates are likely to be for dredged filling and moorum filling ?

A.—The figures are given in the report.

Q.—What is your opinion ?

A.—I have not given my opinion, but the opinion of the Committee is that the figures given in this report should be adopted for the future.

Q.—You don't think that by moorum filling you would complete the work faster ?

A.—No.

Q.—Why not ? You know the Kandivli quarry was taken up in order to get stone and not moorum. Could not you get moorum from places nearer than Kandivli ?

A.—I don't know.

Q.—Could not you get moorum also from the Thana side *via* Dadar ?

A.—I believe there is a certain amount of moorum there, but I don't know that district.

Q.—So there are possibilities of getting moorum from both directions ?

A.—Yes.

Q.—If you can get sufficient quantity of moorum to complete the work in about three years at the rate of Rs. 1·3—the rate will be lower on account of the quantity—would you proceed with the dry filling only ?

A.—I would like to see the total figures worked out before I express an opinion.

Q.—The quantity left undone will be about 22 million cubic yards at 12 annas per cubic yard of dredging, and the cost comes to 165 lakhs. At Re. 1·5 per cubic yard the cost will be 328 lakhs. With the addition of dredged filling it is expected that the work will be done expeditiously.

Chairman.—What do you say to that ? We want an answer to that.

A.—I am not quite clear what the question is.

Sir M. Visvesvaraya.—The question is—whether, with the information before you, you prefer dry filling or dredged filling or would combine the two ?

A.—I would combine the two. Block 8 could be completed using dredged filling, block 7 and block 1 also might be completed by dredged filling. I am doubtful about block 2. Further investigations need to be made as to what material is available in Back Bay.

Q.—About 22 million cubic yards will remain to be carried out and if you do it by dredging the filling will go on at the rate of about $2\frac{1}{2}$ million cubic yard per annum under favourable circumstances. It will take about ten years to carry out the work. Would you prolong the work to that extent or would you expedite it by moorum filling ?

A.—I would expedite it as far as possible. But I am doubtful whether it could be done in less than ten years, whatever material is used.

Q.—Do you know what was the original estimate ?

A.—I have seen it ; 367 lakhs.

Q.—The estimate was increased to 702 lakhs from the original estimate of 4 crores. If the contract for the dredger had not been entered into they would not have sanctioned the estimate for 702 lakhs. If you take this as an ordinary earth filling proposition, the work might have been done for about $5\frac{1}{2}$ crores.

A.—The position would have been entirely reviewed and they would have considered the advisability of giving up the idea of dredging.

Q.—They could not give up the idea of dredging, because the contract had been entered into. The contract was entered into before the estimate was sanctioned ?

A.—So I have heard.

Q.—Have you formed any opinion regarding the stoppage of the work, at what stage it should be stopped if stopped at all ?

A.—I have formed the opinion that blocks 1 and 8 should be completed and that block 7 may well be completed. With regard to the other blocks I think blocks 2 and 3 should be the last to be taken in hand. That is my personal opinion.

Q.—You have some knowledge of the value of land ?

A.—Not very much, some slight knowledge.

Q.—How much of the land when reclaimed would you set apart for public purposes and how much for Government use ?

A.—I could not give any figures for that. I have seen different plans, drawn up with public parks, and recreation grounds, and one with the site for Government House at Colaba.

Mr. Billimoria.—In your report how did you arrive at the conclusions ? Were the figures arrived at quite independently by you or were they given by the Development Directorate ?

A.—We were checking estimates and the figures were in the first instance given to us by the Development Directorate and we proceeded to check them and revise them where necessary.

Q.—On the assumption that these figures are correct you base your conclusions. If anything goes wrong your conclusions will be upset ?

A.—We first of all satisfied ourselves as to which figures were correct.

Q.—Have you satisfied yourself ?

A.—Yes.

Q.—What steps do you take to verify ?

A.—We checked them. We got different sections ; we checked the sections independently one member or another in his own office. We also took a sample of the material and made an experiment with the sample to see to what extent it shrank.

Q.—How long have you been on this checking, verifying, etc. ?

A.—I think the Committee sat for three months of which very little work was done in the first month.

Q.—For how long was serious work done, for how many days ?

A.—I could not give you the exact number of days. We met on different days.

Q.—You found that very serious mistake had crept into your report. You mention 2·14 which two of my friends have found to be absolutely incorrect ?

A.—I cannot explain how the mistake has crept in. I would like to see the figures of the Committee. I don't say that the report is incorrect.

Q.—If there are mistakes of this nature they are likely to upset all your calculations ?

A.—That will be so if the one incorrect figure has been used in working out the total.

Q.—You were asked about dredged filling and dry filling. Do you think that there is sufficient material for dry filling available which could be brought out for reclaiming this area to Marine Line without interrupting the traffic on both railways, the B. B. & C. I. and the G. I. P., in view of the congestion of traffic ?

A.—It would be rather slow in filling with dry filling because it is difficult to allow more than a certain number of trains to run daily. I think the trains are carrying a maximum load.

Q.—I understand that it is proposed to increase the rail. Do you think it would expedite the work ?

A.—I think it would expedite, but it would also put up the cost.

Q.—Is there room enough ?

A.—Not in Bombay.

Sir M. Visvesvaraya.—They are doubling the track. Why should you think there will be congestion ?

A.—I do not think they are quadrupling the track in Bombay City between Dadar and Churchgate Street or Marine Lines. There would be large expenditure on extra wagons and it is doubtful whether the railway could permit of extra trains during the period when there is suburban traffic. If the tracks are doubled it might be possible to bring a larger quantities.

Q.—It looks like it, *prima facie*. You can bring moorum *via* Dadar from the Thana side ?

A.—From Dadar it could be brought only through the B. B. & C. I.

Mr. Billimoria.—You know that when the Railway Board sanctioned their railway scheme, there was hardly any likelihood of two lines running between Grant Road, Colaba and Marine Lines.

A.—There was no likelihood.

Q.—In view of that how many years would it take to get material for dry filling ? Would it be longer ?

A.—I think it would be longer. It depends on more facilities being given by the railways.

Q.—That would require an additional capital outlay of Rs. 50 lakhs ?

A.—I don't know how much.

Q.—If instead of six trains you were to run double the number, you would require rolling-stock, you would require locomotives, you would require rails. The figures will then run to Rs. 50 lakhs ?

A.—It seems a reasonable figure.

Sir Frederick Hopkinson.—You spoke just now about tests and shrinkage of material. Could you please say exactly how these tests were made and what the results were ?

A.—Small tests were made with dredged filling.

Q.—What kind of dredged filling, mud ?

A.—Yes, mud, in order to find out approximately how far it shrank. We were told by the Engineers that the shrinkage was about 15 per cent. But we were inclined to think it was 1/3. As a result of our investigations, it was decided that 40 per cent. would be a prudent figure to adopt.

Q.—Can you give me the details ?

A.—No, Sir.

Q.—It is very important. Could you ask the gentleman who made them if he can put into writing the exact results of these tests ?

A.—I am prepared to ask the Chairman of the Committee.

Q.—Do you think that can be done ?

A.—Yes.

Q.—Because I am conducting little tests and I should like to have figures.

A.—Mr. Mistry conducted them.

Q.—I would like to know exactly what he did and how he arrived at the conclusion 40 per cent. I presume that 40 per cent. only covered soft mud. It did not refer to clay.

A.—I am not quite certain where he took the sample from. I know before he conducted his experiments he poured off all the water.

Q.—You also suggested about checking the quantities. Did you check them ?

A.—I personally checked the quantities of Block 1, and Mr. Neilson.....

Q.—Quantities of what ?

A.—Sections showing the filling, how much filling has been actually put in.

Q.—In the whole of Back Bay ?

A.—I am speaking of Block 1.

Q.—So that you can speak from your own knowledge the exact quantity still required to fill up block 1 ?

A.—I can speak from the knowledge of the figures which were arrived at by the Committee. I checked the sections.

Q.—Isn't that the same thing ? You checked the sections, you arrived at a certain figure and that is the figure which appears in Mr. Neilson's report. These are your conclusions, but you depend on the Engineers for sections. Did you agree with the Engineers as to the quantities ?

A.—The figures are very nearly the same.

Q.—Did you try that in block 7 ?

A.—Mr. Neilson checked them.

Q.—Did they agree with the Engineers' figures ?

A.—I think so.

Q.—Did you try in block 2 ?

A.—No, Sir. No estimate for block 2 was given to us for checking.

Q.—Really you are only telling us that you checked the figures and guaranteed them so far as blocks 1 and 8 are concerned. Did you separate the dredged filling from the moorum ? What was the measurement you took ?

A.—A depth of 1 foot. For block 1 the moorum was 70,000 brass by lorries and 40,000 brass by trains.

Q.—What about block 7 ?

A.—The last page gives the figure for moorum filling as 97,800 brass. I think the depth was 1 foot.

Q.—Would you mind letting me know, because the quantity of moorum required depends entirely on the time when it is done. If you go to block 8 and decide to finish that off with moorum filling some of the ground is hard enough to carry the moorum. Other parts of the filling are not hard. Consequently the moorum sinks into it. Instead of putting a foot, you might put 6 feet ?

A.—I would not recommend that. I do not think that the filling of block 8 should be completed by moorum alone.

Q.—It is said that it was not worth while putting any more dredged material in block 8 ?

A.—That is the opinion of the Development Department.

Q.—Do you agree with that ?

A.—No.

Q.—Have you got the level for filling block 8 ?

A.—They have got the sections.

Q.—Who have got the sections ?

A.—The Development Department.

Q.—You handed them back? Would you mind asking Mr. Elgee as to the present surface levels of block 8? The quantity of moorum required would depend entirely on the time when it was done. If it was done, after dredging was done, it would take much more than if it was allowed to rest. Therefore the foot allowance you make for moorum is quite tentative. It depends entirely on circumstances.

A.—It depends on whether they complete it with dredging.

Q.—It depends on when they complete it?

A.—No, I don't think.

Q.—If you start filling block 8 with moorum and if the dredged filling is soft, moorum would sink?

A.—The dredged material would not harden first but shrink and the consequence would be that far more moorum would be required than it would appear from the present state.

Chairman.—In the report to which you put your signature you say that as regards the cost of moorum filling the figure of Rs. 5·79 per brass can be adhered to. May I take that as an assertion by you as a professional man?

A.—That was the opinion of the Committee, Sir.

Q.—Do you pledge yourself to that?

A.—No, Sir. I do not pledge myself to anything.

Q.—You have put your signature?

A.—That is my opinion.

Q.—You pledge your professional opinion to that statement?

A.—My opinion.

Q.—Professional opinion?

A.—Yes.

Q.—And would that mean, turning the cost from brass into cubic yards, that it is an assertion of your professional opinion that you can get dry filling at Rs. 1·56?

A.—That is the figure that has been arrived at.

Q.—You put your signature to a document and you say this figure can be adhered to at 1·56. Do you mean to say that that is your present belief as a professional man?

A.—Yes.

Sir Frederick Hopkinson.—I should like you to give me the details as to how you arrived at the figure 1·56. I should like to know the factors that entered into that calculation.

A.—I have not got them here.

Q.—Could you get them?

A.—Yes.

Chairman.—I should mainly like you to give me the details as to how you arrived at 1·56?

A.—I have not got them here.

Q.—Have you ever had them?

A.—Yes. The Development Directorate supplied them to the Committee.

Q.—This rate, *i.e.*, Rs. 1·56 will, in your opinion, have to be adopted to provide moorum for the whole area?

A.—Subject to the correction that my copy shows 2·14. Subject to that, the answer is in the affirmative.

Q.—You think that the reclamation area can be filled with moorum at Rs. 1·56?

A.—Such moorum as is required in blocks 1, 7 and 8.

Q.—Do you consider that the entire area could be filled at the rate of 1·56 per square yard?

A.—I cannot answer that question. I have not got enough details to form an opinion.

Q.—Had you enough details before you to say that the amounts which were suggested in your report could be obtained at 1·56?

A.—Yes, I think so.

Q.—The suggestion is that your Committee took the figures from the Development Directorate and worked on them?

A.—Yes, checked them.

Q.—Without adequate examination perhaps? In the same way as Sir George Buchanan took Mr. Kidd's borings and estimates of cost and was apparently content with them?

A.—I know that the figures of actual cost for moorum were supplied to us by the Development Directorate.

Q.—For the purpose of this report, did you go to Kandivli?

A.—No.

Q.—Mr. O'Rorke said that at present Kandivli, as regards moorum, is more or less worked out. Do you know that?

A.—I do not know that.

Q.—That is the most important point. Mr. O'Rorke giving evidence two days ago said that Kandivli, as regards moorum, is more or less worked out, and that fact alone alters your whole view of figures ?

A.—Yes, it does if it is correct.

Q.—Mr. O 'Rorke ought to know because he is the Engineer in Charge ?

A.—I think he should.

Q.—You were never told that.

A.—We were at least given to understand that there was sufficient material available.

Q.—Did the Committee assume that the whole of this moorum was coming from Kandivli ?

A.—Yes.

Q.—Did anybody ask Mr. O'Rorke, the Engineer in Charge, whether there was enough stuff there to make it possible ?

A.—So far as this is concerned we were given to understand by the Chief Engineer, and not Mr. O'Rorke, that the material was available and would continue to be brought to Bombay as it is being brought at present ?

Q.—Did Mr. Elgee ever put that in writing ?

A.—I do not think that is in writing in so many words.

Q.—Do you know the answers to questions that Mr. O'Rorke gave ?

" Q.—Now about the acquisition of land, at the present moment you have a certain area of land at Kandivli which, as regards moorum, is more or less worked out. If you are going to transfer more moorum to the reclamation site you will have to find some more land." The answer was " Yes ".

" Q.—And it will have to be land that will give you the necessary moorum and within reasonable working distance of a railway ". " A.—Yes ". The next question was " The first step would be to have a certain sum of money to acquire that land out and out or to acquire the right to take away moorum on a royalty basis " ? The answer was " Yes ". Were those considerations present before your Committee when they arrived at the estimate of 1·56 ?

A.—No.

Q.—It would have altered the whole view if you had known that as regards moorum, Kandivli is more or less worked out ?

A.—Yes.

Q.—If Mr. O'Rorke's statement is right, this report is valueless as regards moorum filling is concerned ?

A.—The rate would certainly have to be received.

Q.—As regards moorum filling, can we accept the rate that you have given in the report ?

A.—Not, if there is no moorum filling available.

Q.—Then do you know any land within a reasonable working distance of railway ?

A.—No, I do not know.

Q.—Are you aware whether there is any land within a reasonable working distance of railway where you could get the moorum that you have been taking in this report ?

A.—I do not know.

Q.—Mr. O'Rorke said that first he would want money to acquire the land at royalty basis, he would want a railway connection and then he would require 350 waggons costing about £170,000, that is to complete the whole ?

A.—I would like to point out that the Neilson Committee was concerned only with blocks 1, 7 and 8.

Q.—And as regards blocks 1, 7 and 8 you assumed that the whole of the stuff could be got from Kandivli ?

A.—Yes.

Q.—Either Mr. O'Rorke's statement is wrong or you were misled ?

A.—Information has been withheld from us if Mr. O'Rorke's statement is correct.

Q.—You were misled unintentionally but you were misled no doubt ?

A.—Yes, it appears so.

Mr. Billimoria.—In the report of Neilson's Committee, of which you were a member, you suggest filling of one foot deep of moorum layer. Do you think one foot is quite sufficient for moorum layer ?

A.—It has not been suggested. That was the specification.

Q.—In your report you base your calculations on one foot basis. Do you approve of that suggestion or do you recommend that suggestion ?

A.—As a Committee we were not asked for any opinion.

Q.—Do you not think that a layer of at least 7 or 8 feet deep of moorum is required, because when the moorum dries up and is harder it sinks day by day and you want more filling in, one foot

filling would not suffice. You will now change your opinion from what has been stated in the report that one foot filling in of moorum is not sufficient ?

A.—I do not remember that that was stated in the report ; one foot was the specification.

Q.—Do you adhere to that view or change your opinion ?

A.—I never adhered to that view.

Mr. Billimoria.—A deep layer of moorum is necessary than one foot and there has not been any past experience where one foot layer of moorum was laid.

Sir Frederick Hopkinson.—That depends on the circumstances.

Mr. Billimoria.—I would like to have the exact details by which you arrived at 1·56, the details supplied to you by the Development Directorate, and we would also want to see the details for loading, unloading, transport and whatever other charges there may be.

The witness agreed to supply.

Sir M. Visvesvaraya.—Kandivli is about 18 miles from here but we want moorum from quarries nearer to the works if possible. They went to Kandivli because they got stone. Cannot you suggest a nearer place ?

A.—One would have to go out and inspect the country as to ascertain what material there is.

Q.—You cannot say ?

A.—No, I do not know.

17th Witness

Mr. James Kerr, Chief Engineer, " Kalu "

Chairman.—What are your Christian names ?

A.—James Kerr.

Q.—Are you now the Chief Engineer of the " Kalu " ?

A.—Yes, Sir.

Q.—When did you first make the acquaintance of the " Kalu " ?

A.—Two years and five months ago.

Q.—That puts us to 1923 ? March ?

A.—Yes.

Q.—When did she begin to work ?

A.—She began to work in November 1924.

Q.—You know whether she began to do the work that she was originally bought for ?

A.—Yes, Sir.

Q.—Was not she going to work at first in tandem with " Sir George Lloyd "?

A.—No, I cannot vouch for it.

Q.—We know it was bought for £75,000. When you saw her she was in working condition ?

A.—Yes, as far as it was visible at the time.

Q.—Was she in dry dock ?

A.—She was afloat in Alexandra Dock.

Q.—Do you remember the date when she began dredging in 1924 ?

A.—I could not say the date. It was in November.

Q.—She went out into Back Bay ?

A.—Yes.

Q.—What length of experience have you had of dredging ?

A.—Practically all my life, Sir.

Q.—What was the first experience that you had of suction dredging ?

A.—In Chittagong on dredger " Karnafuli."

Q.—How long ago ?

A.—It was about eighteen years ago.

Q.—What type of suction dredger ?

A.—Trailing suction dredger.

Q.—That means there was no rotary cutter ?

A.—No cutter, Sir.

Q.—But you suck up from the surface of the bed of the sea ?

A.—That is right.

Q.—And depend for your output entirely upon the power of the suction dredger to suck in the bed of the sea ?

A.—That is so, propelling all the time.

Q.—When did you first have experience with a dredger equipped with a cutter ?

A.—When I came to the " Kalu," Sir.

Q.—Now when you went into Back Bay did you know at all what was the nature of the bed of the sea ?

A.—No, Sir, I did not.

Q.—Did you know what depth of silt or clay you were likely to find in any given area ?

A.—No, Sir, I did not.

Q.—What amount of water did you find there ?

A.—The water would be about twelve or fourteen feet at high tide.

Q.—How much in low tide ?

A.—Sometimes *nil.* I take no particular interest in the depth, Sir.

Q.—What did the " Kalu " draw ?

A.—The " Kalu " draws an average of about 10 feet.

Q.—Were you not at a great disadvantage owing to the shallowness of the water ?

A.—Quite so. We had to do tide work.

Q.—Does that mean that instead of the " Kalu " steaming into Back Bay and remaining there week after week she had to go in when the tide was high enough and come out before the tide dropped too low ?

A.—That is so, Sir.

Q.—Was that a business proposition ?

A.—That I cannot say, Sir.

Q.—Try and say. You have got a machine which cost £ 75,000, which repairs had brought to £100,000. You have got a crew of engineers, dredgers, the whole of the equipment complete. Was it a business proposition to run her into Back Bay for two or three hours and hurry her out ?

A.—Financially, no.

Q.—Therefore how many hours' pumping did she do here in the day at that time ?

A.—About three or four hours, dependent on the tide.

Q.—Every time you brought her in you had to connect the pipe line ?

A.—Yes.

Q.—Every time you took her out you had to disconnect the pipe line ?

A.—That is so, Sir.

Q.—How long did that operation take ?

A.—Some time about 20 to 30 minutes according to swell.

Q.—Was an attempt made for the " Kalu " to dredge a hole in which she would have flotation ?

A.—Yes, Sir.

Q.—How long did that take ?

A.—One season.

Q.—Well, it is said in one of the letters that the " Kalu" when she was on the Sewri reclamation dredged a flotation for herself in three tides ?

A.—It was very hard, Sir.

Q.—And apart from its hardness, was there a sufficient face to enable you to get reasonably good results ?

A.—No, Sir.

Q.—By face I mean a layer of silt and then a layer of clay or other dredgeable material of such a depth that you can put your cutter into it and work it economically. Now, the " Kalu " has a suction pipe of 39″ in diameter ?

A.—The " Kalu " had a 42″ suction pipe and 39″ delivery.

Q.—During the whole of the time that you were working on the " Kalu " did the working of the machinery give you satisfaction ?

A.—Quite.

Q.—Have you any fault to find with the " Kalu " as a machine ?

A.—No, Sir.

Q.—The " Kalu " gives an extremely low output per pumping hour, did not she ?

A.—I cannot say, Sir.

Q.—Have you ever been interested enough to know what the " Kalu " did ?

A.—Somewhere about 380 cubic yards. I think so.

Q.—What was her guaranteed output ?

A.—I cannot say, Sir.

Q.—It has been stated to be either 2,000 cubic yards or 1,500 cubic yards. Take it as 1,500 cubic yards per hour. An output of 384 was very poor, just about 25 per cent ?

A.—Yes.

Q.—What was the reason for that ?

A.—That I cannot say, Sir.

Q.—You have told us you have no fault to find with the " Kalu " as a dredger ?

A.—Yes.

Q.—Have you any fault to find with the staff working there ?

A.—No, Sir.

Q.—No fault with the dredger, no fault with the crew. The next thing must be the material ?

A.—Yes, the place we were working on.

Q.—Can you explain the low output of 384 cubic yards to the hour upon any other basis than the quality and the quantity of the material you were working on ? Is there anything else ?

A.—When we started working we got soft stuff. But immediately we went down to a depth of 12 feet below it was very hard.

Q.—You mean 12 feet below the bed of the sea ?

A.—Yes.

Q.—Except for the quality and quantity of material, can you suggest any other reason why the " Kalu " gave a poor output ?

A.—I cannot.

Q.—Before you start dredging operations anywhere, which is the more important matter, to provide dredging plant or to make sure of the nature of the bed of the sea ?

A.—The latter.

Q.—What is your position at present ?

A.—Chief Engineer on the " Kalu ".

Q.—Is she ready, or will she be ready by the 25th October or so to come out and do the work ?

A.—Yes, Sir.

Q.—And is it proposed to use the " Jinga " with her as a booster ?

A.—Yes, Sir.

Q.—As far as you know will the " Jinga " be ready to do that work ?

A.—Yes, Sir.

Q.—And therefore if you can find, or anybody in the Development Directorate can tell you where there is within 35 feet of the surface of the water a thoroughly good face of clay, have you no doubt that the " Kalu " would dredge it ?

A.—The " Kalu " will do it, Sir.

Sir M. Visvesvaraya.—How do you measure the quantity of material pumped out daily ?

A.—It is done by sounding.

Q.—What other observations do you take to make sure that work is proceeding satisfactorily ?

A.—By watching my gauges in the engine room.

Q.—What guarantee is there that you are pumping mud and that you are not merely pumping out pure water ?

A.—By watching the vacuum and pressure gauges.

Q.—Did you test the vacuum gauge by actual experiment, by taking a quantity of water within the pipe and compare the result you expect through the vacuum gauge by measuring the volume of silt in the water you pumped out at any time ?

A.—No, Sir, I did not. My place is in the engine room.

Q.—You are not concerned with the quantity of material ?

A.—Yes, I am concerned with reference to the pump.

Q.—You ought to compare with what you did in the harbour or in the bed of the sea with the output ? Don't you compare the two daily ?

A.—I do not, but that is done.

Q.—Do you observe the vacuum gauge and pressure gauge ?

A.—Yes.

Q.—What is the steam pressure ?

A.—One hundred and eighty lbs.

Q.—Have you got any idea of the cost of dredging ?

A.—I do not know, Sir.

Q.—Is not the " Kalu " rather old ? Is not its capacity affected by age ?

A.—I do not think so.

Q.—It is as efficient as it was when it was first bought ?
A.—Yes, only minor repairs have to be attended to.

Q.—Is the cutter powerful enough ?
A.—Yes, Sir.

Q.—And the engine power sufficient ?
A.—Yes.

Q.—Where do you propose to place the " Jinga " for the next season ?
A.—I suppose immediately behind the line of the " Kalu " nearer the shore.

Q.—Is there any other depth of water ?
A.—There is the hole that we dredged last season.

Q.—Have you any idea as to what distance you can pump ? Can you pump to blocks 3 and 4 ?
A.—We have already pumped about 5,000 feet. I don't know.

Q.—Do you pump to block 1 ?
A.—Yes.

Q.—Are you sure you will be able to pump to blocks 3, 4 and 5 ?
A.—With the aid of a booster.

Q.—You are prepared to do that ?
A.—Yes.

Q.—Does the Chief Engineer consider that he could pump to block 4 ?
A.—I do not know.

Q.—Your expectation is that you would be able to do it ?
A.—I think so.

Q.—Do you expect any difficulty to work with three shifts if the crew is strengthened ?
A.—No.

Q.—How many live on the boat now ?
A.—I think there will be about 30 or 40 men all told.

Q.—How many actually live on board ? Do all of them live there at present ?
A.—A double crew.

Q.—If three shifts are ordered, what changes will be necessary in the present organisation ?
A.—Not very much.

Q.—How many hours of actual work do you hope to put in ?
A.—About 19 hours per day.

Q.—If you work in three shifts you will be working continuously ?
A.—Continuously.

Q.—So there would not be much time lost in stoppages ?
A.—It is all due to pipe line difficulties and so on.

Q.—You are doing 3 to 4 hours work net now ?
A.—No. That was for previous season 1924-25.

Q.—How many hours do you hope to do with your improved experience next season ?
A.—According to the same percentage that we worked this year ; 19 hours is the maximum.

Q.—How many hours did you actually pump last season ?
A.—By double shifts we averaged 12 hours : as high as 15 some days and as low as 10 on others.

Q.—In the coming season how many hours do you hope to put in ?
A.—I should say about 19 hours with three shifts.

Sir Frederick Hopkinson.—How many seasons have you worked in Back Bay ?
A.—Two seasons.

Q.—Is there not something wrong with the figures, as regards the date ? You began in November 1923 ?
A.—It is a mistake. It should be 1924.

Q.—You have made a mistake in the year. Is it 2 years and 5 months ?
A.—Yes.

Q.—About this " Kalu " you say that the coal used is bad and you lose four hours a day for cleaning the fire ? It is a very long time.
A.—Our average is sometimes less.

Q.—Have you got any spare boilers ?
A.—No.

Q.—How many hours did you spend a day for cleaning the fire ?
A.—Three.

Q.—Four hours for cleaning the fire is very serious. I am referring to the 24 hour day.
A.—It is 2 to 3 hours out of 16.

Q.—How many hours do you think you lost for cleaning fire ?
A.—Three hours on the 18 hours shift.

Q.—You have been working 18 hours shift ?
A.—Yes.

Q.—That is a lot of time to lose ?
A.—We have tried our best.

Q.—You might report about the condition of the coal to the Chief Engineer ?
A.—I have done so.

Q.—What coal do you use ?
A.—Bengal No. 2.

Q.—Is Bengal No. 1 better ?
A.—Yes.

Q.—Then it would probably be advisable to get the better coal ?
A.—Yes.

Q—Have you any difficulty in keeping steam ?
A.—Under the coal, yes.

Q.—Are you losing any revolutions in the pump ?
A.—Yes, a slight decrease.

Q.—What is your pump designed to run at ?
A.—I do not know. It is usually designed to run about 140 revolutions.

Q.—Have you no instructions from anybody ?
A.—I have no guide.

Q.—Really you are explorer. You do not know how many revolutions she was designed to run at. Is it not marked on any of the engines ?
A.—No.

Q.—The borings show that there is a layer of sand and clay varying in depth from 4 feet to 21 feet. That is an extraordinary variation. You find that in practice ?
A.—No, Sir.

Q.—You find that you can get more everywhere ?
A.—No.

Q.—Have you got plenty of power in the cutter to cut the material up to 10 feet ?
A.—Yes.

Q.—If the boat's output is poor, it is not in consequence of the cutter not cutting the material ?
A.—No, Sir.

Q.—What is the reason ?
A.—The material is not there.

Q.—It is neither the machine nor the hardness of the material. It is the difficulty of getting to the material ?
A.—Yes, Sir.

Q.—The first season you were out there you were dredging the whole season at the top of high water ?
A.—Yes.

Q.—Only working daylight time ?
A.—Yes.

Q.—It is therefore 3 or 4 hours out of the 24 ?
A.—Yes.

Q.—If you are working yourself, what profit would you make working 4 hours out of the 24 ? Would it not be a very extraordinary price ?
A.—Yes.

Q.—There is no means that you know of to test the percentage of clay in the outer pipe ?
A.—In the delivery pipe—no means.

Q.—If it were sand, you get a test tube and see what the percentage is ?
A.—Yes.

Q.—With clay it is a different thing ?
A.—Yes.

Q.—You could not get a reasonable percentage at the end of the delivery pipe ?
A.—No, Sir.

Q.—You are satisfied that the " Kalu " is a good machine ?
A.—Yes, Sir.

Q.—What is your previous experience ?
A.—I have worked an 18-inch dredger.

Q.—What were you working at ?
A.—Very light sand.
Q.—Where ?
A.—At Chittagong.
Q.—Was it for reclamation work ?
A.—No. It was a hopper dredger.
Q.—The intention next season is, I understand, for the "Jinga" to lie at the northern end of the hole you have made last season and for you to go to the south. You will be coupled up to the "Jinga" and she will be coupled up to the shore. They will have to bring their coal in the barges ?
A.—Yes.
Q.—You live on board ?
A.—Yes.
Q.—You have no objection to working 24 hours a day ?
A.—No.

[Witness then withdrew.]

18th Witness

Dr. N. H. E. Sukhia

The examination of Dr. Nadirshaw H. E. Sukhia then commenced.

The Chairman.—Dr. Sukhia, was there a Government enquiry in 1913 in which this question of a reclamation scheme was considered ?
A.—Yes.
Q.—And was that referred to a sub-committee ?
A.—Yes.
Q.—And were the considerations of that committee ultimately put in the form of a report, namely that of the Bombay Development Committee, 1914 ?
A.—Yes, in a book form.
Q.—Did you give evidence before that committee ?
A.—I sent a written statement as asked by the Corporation.
Q.—That is what we find at page 99 of the report ?
A.—Yes, and onwards.
Q.—On the subject of reclamation did you say this: "I think it will be conceded by every one without exception that the growing needs and wants of the ever and vast increasing population of Bombay must require a recourse to a reclamation scheme, if there is no suitable space and ground available for the development of Bombay so as to meet all its requirements for, say, the next 25 or 30 years"?
A.—Yes.
Q.—And in your copy the words "if there is" are underlined, showing that you were attaching great importance to the question as to whether there was any other suitable space and ground available ?
A.—Yes.
Q.—You then make the point that the "expenditure should be cautious so as not to put on the then generation a large burden of which they would only have a partial enjoyment" ?
A.—Quite so.
Q.—And having limited the period of extension for the period of 25 to 30 years you say as follows: "For this period of time and even longer I am respectfully of opinion that Government have at their disposal ample space and ground now existing within the town and island of Bombay or within its close vicinity without resorting to any huge reclamation, if the suggestions I now submit meet with the approval of the committee and Government"?
A.—Yes, quite so.
Q.—And then speaking of the reclamation scheme you say: "The reclamation scheme which I believe Government have had under their consideration for the last few years is that which owes its origin to Lord Sydenham or his Government. That scheme may probably be a necessity some 50 or more years hence" putting it to 1963 or 1964. "It will cost some crores of rupees, and the question therefore is, if by utilising half that sum we can fairly meet all our requirements, setting aside for the moment the huge outlay of sinking and interest funds which the reclamation will entail, is it desirable or wise that we should launch on an expenditure of crores and crores of rupees, the full advantage of which neither this nor the succeeding generation can get ? However, if Government can successfully finance the reclamation scheme, of which I am very sceptical, it will afford some means of dealing with the problem of the growing requirements of the city for the convenience of future generations".
A.—Yes.

Q.—Have you been from the time that you wrote that memorandum right up to the present day of much the self-same opinion ?

A.—Yes, up to April 1926.

Q.—Were you a member of the Advisory Committee in June 1921 ?

A.—Yes.

Q.—I think you were the representative of the Bombay Municipality ?

A.—Yes.

Q.—And did you wish to bring up before that Advisory Committee the question whether the Bombay Reclamation scheme should be abandoned at present or postponed for at least 5 years ?

A.—Yes.

Q.—That was, I think, on the 20th June 1921 ?

A.—Yes.

Q.—I am only putting that forward to confirm what you said a few months ago that that was your view ?

A.—Yes.

Q.—That question was considered by the Chairman and it was decided that it was not a question which could usefully be discussed by the Advisory Committee ?

A.—Quite right.

Q.—I think we ought to make that quite clear. The reason given was that the Advisory Committee was a committee to advise upon work in progress already sanctioned by Government ?

A.—That is right.

Q.—And not to discuss questions of policy which might have the effect of reversing the decision of Government ?

A.—No.

Q.—Criticising the settled decisions of Government ?

A.—No.

Q.—The subject is referred to in the letter of 24th June 1921. It was a letter from Sir Lawless Hepper and runs as follows :—

> " Dear Sir,—With reference to your letter dated 22nd instant addressed to the Secretary of the Advisory Committee, I beg to explain that the Directorate of Development is an executive body, especially created to carry out certain schemes sanctioned by Government and the Advisory Committee has been appointed to advise the contractor on matters relating to the work of the Directorate in connection with the carrying out of the scheme."

A.—Quite right.

Q.—" The question raised by the Bombay Chamber of Commerce mainly relates to the general policy of Government in sanctioning the Back Bay Reclamation project and cannot suitably be discussed by the Advisory Committee."

A.—I was prevented from discussing further.

Q.—That might have been the right view for Sir Lawless Hepper to take having regard to the constitution of the Advisory Committee.

A.—It was this statement that made me think that Sir Lawless Hepper had that view.

Q.—As I say, I only mentioned to you your wish that the Advisory Committee should consider the question as to whether the Back Bay Reclamation Scheme should be abandoned or postponed for at least five years, to show that throughout this has been your attitude.

A.—Quite right.

Q.—You know generally the position of the work at the moment. Have you any suggestions to make as to what might be the work to be undertaken in future or whether the work should be wholly abandoned ?

A.—I think the work should be gone through.

Q.—And do you mean the whole of it ?

A.—Yes. From the health point of view as well as from the business point of view.

Q.—Tell me first from the first point of view.

A.—All those big areas of sea water may deteriorate, if it is not carried through, and the result on the public health will be serious.

Q.—You say the sea water is deteriorating at present over 850 feet, through which the tide comes ?

A.—Yes ; whenever it is stagnant ; at present the sea water is moving, but when it is put into blocks it won't.

Q.—No, no. But once it is to be put into blocks, it is intended to reclaim these blocks as quickly as possible ?

A.—Yes.

Q.—At the present minute the tide goes over 850 feet and keeps the water interior of the sea wall and you can have daily two great tides. So there is no reason to apprehend that the water will in fact be any danger to health ?

A.—I think it would become stationary. Although there will be a tide to bring in fresh water, it won't mix with the old water to such an extent that it would become harmless.

Q.—In your view, Bombay having embarked upon this scheme, it should be carried through ?

A.—Yes, both from a health point of view as well as the business point of view after spending away crores of rupees.

Sir M. Visvesvaraya.—Have you any idea of the present price of land in this neighbourhood ?

A.—Yes. I think no less than about Rs. 100 per square yard.

Q.—Is the value falling or rising ?

A.—It is falling.

Q.—If the whole area is completed, at what rate you think the land can be sold ?

A.—Between Rs. 50 and 65 per square yard.

Q.—Do the public of Bombay want the early completion of the scheme ?

A.—My own view is that it ought to be from two points of view, as I said,—from the health point as well as business point of view.

Q.—You are in favour of completing the work ?

A.—Yes.

Q.—But what about cost ?

A.—If it had been provided in the very beginning, the public would not have suffered. It ought to have been provided by Government from the very beginning.

Q.—The scheme would not have seemed profitable if they had done so.

A.—Why not ?

Q.—It would have been very costly ?

A.—I doubt very much ; it will not be very costly. Perhaps you may not be aware that just at the site of Bruce lane, the Tata Company gave Rs. 900 per square yard.

Q.—Rs. 1,150 ?

A.—In one case it was Rs. 1,150 ; in another it was Rs. 900. If this be the cost, why should not the new land fetch higher price ?

Q.—Would not the prices in Bombay be disturbed if you throw open such a large area ?

A.—I do not think so.

Q.—You want to complete the scheme ?

A.—Yes.

Q.—And if it costs a considerable amount, you will face it ?

A.—I don't mind the cost ; I say from the public health as well as business point of view these things should be carried out.

Q.—Do you suggest any change or method in the execution of the work ?

A.—I would rather suggest this : instead of the Directorate, it must be by private contracts.

Q.—What is your idea about the Public Works Department ?

A.—I think they can stand against all this.

Q.—At the time the scheme was sanctioned was there any public demand for it ? And from what classes of people ?

A.—There was ; from almost all classes.

Q.—In the Bombay city or in the moffusil ?

A.—In the Bombay city itself. That is my experience.

Q.—Why did you not sign either of the reports of the Advisory Committee ?

A.—For this reason : I was no doubt aware I was doing the right thing at that time ; but now I am convinced, after certain statements submitted by Sir Lawless Hepper at the instance of Manu Subedar, that the scheme should be carried through. Therefore I signed it with the majority.

Sir Frederick Hopkinson.—Have you had any experience of the Public Works Department ?

A.—I have not.

Q.—So you cannot give us any information as to whether it is highly efficient or not ?

A.—I could give, but I think it is worth nothing, as I am not an Engineer.

Q.—So please keep it. Can you tell me whether the Public Works Department had experience of such reclamation works ? Are they more concerned with internal works or land works ?

A.—So far as internal works go, they are concerned.

Q.—Do you know whether they do reclamation work of this kind ?
A.—I do not remember.

Q.—On broad grounds, inasmuch as the work is managed by business people, you would prefer it to be given out on contracts ?
A.—Yes.

Q.—That is your experience after a fairly long time ?
A.—Yes.

Mr. Billimoria.—Do you speak in your personal capacity or representative capacity as representing any public body ?
A.—At present in my individual capacity.

Q.—You have signed the interim report of the Advisory Committee dated 17th February 1925 ?
A.—Yes.

Q.—Who supplied the information and the figures in connexion with the said report ?
A.—Sir Lawless Hepper.

Q.—Relying upon the information and the figures furnished to you you arrived at your conclusions ?
A.—Of my own experience I speak.

Q.—The benefit of which the Committee had ?
A.—Yes.

Q.—Do you know, Dr. Sukhia, that the original estimate that was sanctioned by the Government of India was over 367 lakhs ?
A.—Quite right.

Q.—That was subsequently increased to 5 crores, and 7 crores, and now the figure is in the vicinity of 11 crores ?
A.—Yes.

Q.—You also know that none of these figures include any interest ?
A.—No.

Q.—You are aware of that ?
A.—Yes.

Q.—As a business man, Dr. Sukhia, you know when a business is undertaken on a capital investment, if you are getting your return after certain number of years, you always calculate interest on the capital and see whether the venture is going to be profitable or otherwise ?
A.—I don't mind for the profit of the scheme ; I am concerned more for the public health.

Q.—You are looking at it from the health point of view ?
A.—Yes, principally.

Q.—Having regard to that you would be prepared if the City of Bombay had lost several crores of rupees ?
A.—Quite right ; I do feel it.

Q.—Do you know that when the estimates were prepared they were based on certain calculations which calculations now turn out to be incorrect or out of the market ?
A.—It is their look out who made the estimates.
To my mind the estimates are not even now correct.

Q.—And if those estimates go to you round you would still insist upon the scheme ?
A.—Public health must have the first consideration.

Q.—When you talk of public health, is it your suggestion that at present the health of the citizens of Bombay is suffering without that reclamation ?
A.—I think so.

Q.—With the reclamation the health will be considerably improved ?
A.—Much improved.

Q.—In what manner ?
A.—There will be very large open area for sea airing and other matters, which will actually lead to the public health being properly maintained, and there will be no stagnaceant areas of water.

Q.—You mean that after the reclamation a large area of land will be left vacant for recreation grounds ? Is that your idea ?
A.—Not that. As soon as it is reclaimed there would be a good sea breeze coming on the reclaimed land and that would be beneficial to the people.

Q.—Living on the reclaimed land ?
A.—Behind it.

Q.—What is there to prevent the people getting fresh air to-day ?
A.—They cannot go there ; there is the sea water there.

Q.—There will be sea water in spite of the reclamation ?

A.—No ; there won't be ; we must go on in such a way that the scheme is finished within some years.

Q.—Supposing the wall is completed and the two ends which have not yet been joined have been joined, there still will be sea in front of the sea wall ?

A.—There is a little difference between the two.

Q.—What is it ?

A.—The difference is that the stagnant sea water will be within the area of the wall itself which will be dangerous to the health of the people.

Q.—Before this reclamation was undertaken, was the water stagnant ?

A.—No.

Q.—Have you no reasons to suppose that the water will be stagnant if the two ends are not joined ?

A.—It is a natural consequence.

Q.—You draw this inference from a medical point of view ? Are you supported by medical authorities in this matter ?

A.—If you ask that, unfortunately my health does not permit me to go through all these details. I do feel that that is the proper view everybody should take if he has at heart the good of the people.

Q.—By reclaiming this 1,145 acres of land, is it going to make a material difference to the health of the citizens of Bombay ?

A.—Not only health but also business point of view.

Q.—I shall come to the business point of view. Let us finish health point first because as a medical man you will be in a better position to offer your views.

A.—I do.

Q.—How do conditions telling upon health improve by the reclamation of this strip of land?

A.—There will be no stagnant water there. And whenever there is stagnant water, whether it is fresh or salt water there is chance of infection.

Q.—So your belief is based on the assumption that there is stagnant water ?

A.—It will be a fact.

Q.—So in spite of other recommendations which have been put forward for filling in some of the blocks you are in favour of completing the whole scheme ?

A.—By degrees.

Q.—No matter what it costs ?

A.—Yes.

Q.—Even if there is a tremendous loss of several crores of rupees you would still disregard that loss and complete it ?

A.—Yes ; it will be in the interests of the public health of the city of Bombay.

Q.—You would not look at it from the point of view of business, whether the scheme is going to be profitable or otherwise ?

A.—That is a secondary question ; if the whole plot is filled in, the land that will be sold will fetch a high price unquestionably.

Q.—Have you any idea as to what it will fetch ?

A.—Between Rs. 50 and Rs. 65.

Q.—The whole of the reclaimed land after providing for roads, etc. ?

A.—Yes.

Q.—Do you think there would be an immediate demand for all the land 300 acres ?

A.—I am not so rich, but there are some rich multi-millionaire people who do desire to take it ; I can mention one name who wants to take up a large area at any cost to have a fire temple put up.

Q.—How much area would he take up ?

A.—He wanted several acres of land : simply to keep up open space for the benefit of the fire temple.

Q.—Is he a multi-millionaire that he would give away several lakhs ?

A.—He was.

Q.—Then he is gone ?

A.—Unfortunately he is dead and gone.

Q.—That is very uncharitable. Now, the report that was signed was dated 17th February. Since then in January 1926, another report was published which is known as the second interim report, with a minute of dissent by Manu Subedar. Have you gone through it ?

A.—No.

Q.—I suppose you have been in sick-bed for a long time ?

A.—Yes.

Q.—Detached from public life ?

A.—No ; I am not detached from public life.

Q.—You are no longer a member of the Corporation ?

A.—No.

Q.—You don't take any active part in the debates of the Legislative Council ?

A.—So long as I am not there I cannot do it.

Q.—You are still connected with the public life of Bombay ? In which way ? Do you make speeches on public platforms ?

A.—Very shortly ; I am going to make one very shortly.

Q.—Have you got a copy of the interim report ?

A.—Unfortunately it is not with me now. (A copy of the report was handed to the witness.)

Q.—You know that when you signed that report on 17th February 1925, yourself and the other members of the Committee who signed that report did not know or were not told that the dredgers were not working satisfactorily. Had you that information, inasmuch as the required output was not produced ?

A.—I do not believe that story at all.

Q.—Now, if you are told to-day that the information is absolutely correct, would you believe it ?

A.—No ; I have personal experience ; I had been to the Colaba site after dredging ; I had been also to the other side, the east side and I saw the dredger was working very nicely.

Q.—As to the hearing of the sound, it is all right ?

A.—Not the sound, the quantity of material thrown out.

Q.—Do you know what was the capacity of the dredgers ? How much output was required ?

A.—2,000 cubic yards.

Q.—Do you know that the dredgers have never given that output ?

A.—Because there was not sufficient number of shifts.

Q.—Do you think if there was sufficient number of shifts there would be sufficient output ?

A.—That is my view.

Q.—But you are not an engineer ?

A.—I am not ; but I am a commonsense man, as you know very well.

Q.—If you will kindly turn to page 3 of the report that you have signed, in paragraph 8 you say " The total expenditure on the Back Bay Reclamation to the end of December 1924, including interest, may be taken at Rs. 468·54 lakhs, out of which it has been estimated by the Chief Engineer that about Rs. 57·00 lakhs might be recouped by the sale of plant. The net immediate burden on Government would therefore amount, in round figures, to Rs. 4 crores ".

A.—Yes.

Q.—Now with regard to the 57 lakhs, that was the figure furnished to you by the Department and you put it as correct ?

A.—Yes, I supposed it.

Q.—Suppose that figure is an overestimate, would you still say that the net expenditure would be 4 crores only ?

A.—Yes, until other facts are brought forward.

Q.—Would you still say that ?

A.—Yes.

Q.—In spite of the figure of realisation being lesser ?

A.—Yes : that is no good mathematics, that is my experience.

Q.—Your experience is different from Arithmetic. If you kindly turn to paragraph 9, " As an alternative to closing down the work completely, it might be possible to modify it by reducing the area to be reclaimed either permanently or by postponing part of the reclamation to a later date". Do you still stick to the same opinion ?

A.—This is drafted by the Chairman. I signed it and I stated there distinctly " seen " meaning only seen.

Q.—That means you don't agree with those conclusions ?

A.—I might have or might not have agreed fully.

Q.—Is it not a fact that when a report is being signed and if you are not in agreement with the views expressed therein, you put in a minute of dissent ?

A.—Not necessarily ; if you say " seen " it means dissent.

Q.—Is that the practice followed ?

A.—That is followed in the Municipality.

Q.—Nearly 20 years since, is that the rule ?

A.—That is the usual practice.

Q.—Then you don't agree with the conclusions of this report *in toto* ?

A.—No.

Q.—In what material particulars do you differ from the conclusions arrived at in that report ?

A.—It has been stated that Nos. 3, 4, 5, 6 and 7 blocks should also be taken. I said " No": first finish up 1, 2 and 8.

Q.—That is your view ?

A.—Yes.

Q.—Your view is that you should complete blocks 1, 2 and 8 ?

A.—That has first to be done. That does not mean that we should leave off others completely.

Q.—This is not stated in the report ?

A.—No.

Q.—If you will kindly turn to page 4, paragraph 10, you go further and say " It would appear, therefore, that the Back Bay Reclamation Scheme, having reached the stage it now has, should be proceeded with unless it can be established that there are serious grounds for believing that the scheme is unsound from an engineering point of view....." How do you know whether it is sound or unsound from an engineering point of view ?

A.—I consider it sound from a commonsense point of view.

Q.—In the Interim Report of the Advisory Committee for 1924, you say, "It would appear, therefore, that the Back Bay Reclamation Scheme, having reached the stage it now has, should be proceeded with unless it can be established that there are serious grounds for believing that the scheme is unsound from an engineering point of view, or that it is likely to result in an ultimate financial loss greater than that which would be entailed by closing it down ". Now, Doctor, where did you get your engineer's experience from ?

A.—By being a member of several committees of the Corporation as well as by my connection with the Development Department and bodies like the Advisory Committee.

Q.—" Or that it is likely to result in an ultimate financial loss greater than that which would be entailed by closing it down ". Do you subscribe to that ?

A.—Yes.

Q.—In paragraph 11, you say, " The actual cost (including interest) per square yard of net developed building area will be in the neighbourhood of Rs. 30. "

A.—Yes.

Q.—You base your calculation on the expectation of the land being reclaimed " net developed building area at a cost of Rs. 30 ".

A.—That is the Chairman's view.

Q.—Not your view ?

A.—My view is that I have said " seen ".

Q.—You differ also here ?

A.—Yes.

Q.—What is your idea of the cost ?

A.—My idea is that the cost may be anything.

Q.—Even a thousand rupees a square yard would not matter ?

A.—I mean it would fetch a higher price.

Q.—I know your views, Doctor, and now I shall ask you a few questions in connection with your answers given to our friends here. You said that in the reclaimed area the price to be realised would be about Rs. 100 and then you modified it by saying on an average between 50 to 65 rupees.

A.—Quite right.

Q.—Do you say that from any personal experience ?

A.—Certain gentlemen asked me to get a large area of land at that rate.

Q.—What do you mean by " large area " ?

A.—Several acres of land.

Q.—Out of 1,145 acres, how many ?

A.—I think nearly about 100 acres.

Q.—To build a Fire Temple ?

A.—He wanted to put it up on the style of Framjee Cowasji's.

Q.—That won't require so much ? Do you know how many square yards 100 acres mean ?

A.—There are some orthodox people who don't mind their money in the matter of building a temple for every acre of land there are 4,840 Sq. yards of land.

Q.—In reply to Sir M. Visvesvaraya you said that you knew very well that Rs. 1,150 was realised at booming time ?

A.—Yes.

Q.—Do you think you can realise to-day anything like that ?

A.—Unfortunately the very people who offered it realise that the price has gone down.

Q.—Do you think that there is anybody living who would come forward for Rs. 1,150 per square yard in any part of the City of Bombay ?

A.—I cannot dogmatise it.

Q.—Anybody to pay Rs. 900 a square yard ?

A.—I think it would be doing a job really speaking.

Q.—Where did you get that experience from ?

A.—From my personal experience, of course.

Q.—Is that for the business area or residential area ?

A.—Both.

Q.—You will get Rs. 900 for residential area ?

A.—Residential area plus business area.

Q.—Do you know that within a few yards of the business locality the price of land is not maintained at the same figure. For instance, the price of land in Hornby Road or Esplanade Road is not the same as in Pitha Road.

A.—You are not aware that Rs. 1,100 is offered on the Hornby Road. If the Hornby Road is opened up I think it will fetch a very high price.

Q.—What do you mean by high price, Rs. 1,100 ?

A.—Rs. 700 and something more.

Q.—You were a member of the Municipal Corporation when the Hornby-Ballard Estate Scheme was drawn up. Do you know what was offered for the acquisition of the Ballard property ?

A.—They offered because they wanted to be cheese-sparing. Later on they paid under a Court's Decree so far as I know about Rs. 900 odd

Q.—Per square yard ?

A.—Per square yard in Hornby Road near Sir Dinshaw Petit House.

Q.—I am talking about the Hornby-Ballard Scheme.

A.—Just in the back-ground, what is called the Pitha Street, they have paid Rs. 900.

Q.—Because they acquired it in the front ?

A.—No, no, this is in the back.

Q.—Who awarded that ?

A.—I think the Development Department or the Municipality.

Q.—You are under an impression that if any property is put up for sale it would fetch Rs. 700 ?

A.—Particularly, on that spot.

Q.—If you go 50 yards further up ?

A.—I cannot say that.

Q.—What would you get within a distance of 50 yards from there ?

A.—No less than about Rs. 800 to 900.

Q.—In Pitha Street ?

A.—Yes.

Q.—If you hold any building or land at that position ?

A.—Yes.

Q.—Do you know of any instance recently ?

A.—No, there was a property which was worth only Rs. 8,000. It has been sold for Rs. 60,000 very recently.

Q.—So you consider that on the reclaimed area within a few yards of the business locality the probability is that you might realise about Rs. 700 a square yard ?

A.—That is my conviction.

Q.—And it is based on that conviction that you have recommended the completion of the scheme ?

A.—Yes.

Chairman.—Generally, I understand you to say throughout the whole of the reclaimed area you think an average of Rs. 50 to 65 would be obtained ?

A.—That is my view.

Sir M. Visvesvaraya.—What is the value of land at present to the west of the Hornby Road and to the east ?

A.—To the east it comes to Rs. 200 to 500, in the west it comes to Rs. 900 to 1,100.

Q.—You can't get land at less than that ?

A.—No.

19th Witness

Mr. W. Speirs, Assistant Dredging Master

Mr. Speirs, Assistant Dredging Master, was called in and examined.

Sir Frederick Hopkinson.—What is your full name ?

A.—William Speirs.

Q.—What is your position ?

A.—Assistant Dredging Master.

Q.—When appointed ?

A.—February 1924.

Q.—What dredger are you employed upon ?

A.—" Sir George Lloyd ".

Q.—The whole time ?

A.—Yes, Sir, since 1924.

Q.—What has been your past experience of dredging ?

A.—None at all.

Q.—Are you keenly interested in dredging ?

A.—Yes, Sir.

Q.—Your father is an old dredging master ?

A.—Yes.

Q.—Who is associated with you ?

A.—Mr. Merritt.

Q.—You take alternate shifts ?

A.—Yes, Sir.

Q.—You are working, how long ? 17 hours a day ?

A.—16½ hours.

Q.—The dredger stops for meal time ?

A.—Yes, ¾ths of an hour.

Q.—Don't you think it a luxury ?

A.—No, Sir.

Q.—A very powerful and expensive machinery to stop for meals ? Don't you think it should work right through ?

A.—Yes.

Q.—Do you see any objection to its working for 24 hours ?

A.—No, Sir. It can be worked in two shifts of 12 hours each.

Q.—After all it is not a life-time sentence, it is only 6 or 7 months in the year that it is working. Can you tell us why the output of the dredger has been so low ?

A.—There was no material.

Q.—What do you mean by that ?

A.—No material below the ship, we have no 'face'.

Q.—What was the depth of your face ?

A.—Sometimes 25 feet, sometimes 15 feet.

Q.—But 25 is a good deal ?

A.—But sometimes the material is very soft.

Q.—Can you tell me what particular areas you have been dredging on ?

A.—I was working outside Colaba, in the inside and outside the Oyster Rock.

Q.—You have been working on the dredger since 1924 ?

A.—Yes.

Q.—Taking your memory back to November 1924, can you tell me on the plan where you were dredging ?

A.—Inside the Oyster Rock.

Q.—That would be block K. Were you also working in block G ?

A.—Yes.

Q.—What sort of material was it ?

A.—Partly clay.

Q.—This plan shows that there was no clay in any of the blocks ?

A.—There was blue clay.

Q.—Covered with mud ?

A.—Covered with 10 feet of mud.

Q.—According to this plan there is more mud than clay ?
A.—There was not much on the shallow ground.

Q.—Was that a fairly even surface ?
A.—No.

Q.—What caused it to be uneven ?
A.—It was very uneven.

Q.—Was clay sticking right up to soft material ?
A.—No, all mud was on top.

Q.—Can you give me any idea of the comparative quantities of clay and mud in those two blocks ?
A.—I cannot say.

Q.—Did you notice any particular difference in that material ?
A.—Yes, the clay was very tough.

Q.—Before you got to this clay, you were on to this so-called silt which is really little better than liquid mud ?
A.—Yes. It is practically liquid dirty water.

Q.—Did you have any one on board the " Colaba " testing the percentage of mud ?
A.—I do not think so.

Q.—Do you take any on board ?
A.—No.

Q.—Nobody suggested that you should test the material as it went through the pump ?
A.—No.

Q.—You simply turned on steam and trusted to Providence ?
A.—Yes.

Q.—Let us come to second year. Can you tell me where you were pumping in the second year ?
A.—It was outside the Oyster Rock.

Q.—That is in blocks J and H. In block J there is as much clay as mud but in block H there is about 7 per cent. of clay and about 93 per cent. of mud. Did you notice any difference in the working in the second season ?
A.—It was just the same.

Q.—In the third year where you were working ?
A.—Close up the oyster rock, that is block H.

Q.—Did you get the same results here ?
A.—Yes.

Q.—But the records of reclamation appear to show that you have done very much better work than in either of the other two seasons ?
A.—Yes, it was better material and there was more clay.

Q.—Did the cutter had any difficulty in cutting the clay ?
A.—When she was at the bottom of the hard stuff.

Q.—Can you say if it was moorum ?
A.—That was very hard ; I cannot say.

Q.—Did the cutter ever pull up ?
A.—Yes at the bottom.

Q.—Where do you intend to work next season ?
A.—Up against the oyster rock again.

Q.—What depth have you dredged over the sections K and J ?
A.—About 35 feet but we had gone down to 65 ft.

Q.—When ?
A.—In the second season over H.

Q.—In the first season ?
A.—We were dredging 70 feet.

Q.—Did you notice any difference in the dredging when you were dredging 70 feet or 65 feet ?
A.—It was better at 70 feet.

Q.—Is it a fact that harder the work, the better she would pull ?
A.—Yes.

Q.—Did you ever feel that " Colaba " is not working fast enough ?
A.—She has, I believe, identical pumping engine.

Q.—She has never caused you any difficulty ?
A.—No.

Q.—You have been dredging comparatively at a short distance from the Colaba ?
A.—Yes.

Q.—Had you much trouble with your floating pipe ?
A.—Yes.

Q.—What was the cause of it ?
A.—Swells and winds.

Q.—That is the natural thing. You cannot stop swells. Did anything else cause you trouble with the floating pipe ?
A.—Yes, the joints were breaking.

Q.—Did you lose much time on account of that ?
A.—No.

Q.—Can you tell me if there is any difference between the pumping engines when you are pumping in liquid mud and when you are clearing the pipes ?
A.—No, Sir. I cannot say.

Q.—So that you can only tell that the engines were working all the time ?
A.—Yes.

Q.—Have you seen Sir George Buchanan on Board ?
A.—Only once.

Q.—During all the time he has been here ?
A.—Yes.

Q.—Did he say anything to you about dredging ?
A.—No.

Q.—He never discussed it with you ?
A.—No.

Q.—Did you ever hear on board if Sir George Buchanan made any complaints about the way in which the dredger was handled ?
A.—No.

Q.—Did you ever hear that he was satisfied ?
A.—No ; I cannot say.

Q.—You heard nothing about it ?
A.—No.

Q.—He never came and raised a storm that you were doing less than the machine was designed to do ?
A.—No.

Q.—Do you know if he ever said to anybody else ?
A.—I do not know.

Q.—Have you plenty of power in the engines ?
A.—Yes.

Q.—So that if you require you can get plenty of power ?
A.—Yes.

Q.—Did you ever thought of the feasibility of increasing the speed of the cutter ?
A.—That is for the engineer.

Q.—Are there no fixed number of revolutions given in the instructions issued with the dredger or the rate it is to work at ?
A.—I do not know.

Q.—Do you know the reason for the poor output ?
A.—That depends on the material you are dredging.

Q.—If you had more clay you would have been better off ?
A.—Yes.

Q.—Is this a correct summary of what you say, that the low output is more likely to be due to the lightness of the mud than the hardness of the clay ?
A.—Yes.

Q.—Does that express your view ? If you had more clay you would be far better off ?
A.—Yes.

Q.—Do you feel any doubt about it ?
A.—No.

Q.—You have been on board the dredger for a long time when she has been dredging. Can you suggest any improvement to be made to her ?
A.—No ; I cannot say.

Q.—Has she worked during the whole period with great steadiness ?
A.—Yes.

Q.—How would you describe to anybody else what sort of dredger have you ?
A.—I have got a very fine dredger.

Q.—You cannot suggest any improvement ?
A.—No.

Sir M. Visvesvaraya.—The failure of the dredger to give you the required output is the insufficiency of the depth of clay ?
A.—Yes.

Q.—Would it work better if there were sand instead of clay or mud ?
A.—It would be just the same, I do not think it would make any difference.

Q.—With mud it would not work so well ?
A.—She does not work with very soft mud.

Q.—What observations do you take daily and what records do you keep ?
A.—We only keep dredging hours.

Q.—Does anybody take soundings ?
A.—Yes, the surveyor does it.

Q.—Does he take soundings every day ?
A.—Yes.

Q.—Do you take soundings continuously day to day for a week or ten days ?
A.—The Surveyor comes daily, once a day.

Q.—He takes soundings only for the work done during that day ?
A.—Yes.

Q.—And not for the week or season ?
A.—He continues it daily throughout the season.

Q.—You do not take a correct average ?
A.—Yes, he does it.

Q.—Do you measure the quantity excavated by taking soundings in the material dredged ?
A.—Yes.

Q.—How do you measure the output through the pipe ?
A.—The Surveyor takes measurement of the output.

Q.—Is there any other man employed for testing the output by allowing the liquid to lie for a couple of hours and then measure the mud ?
A.—I have nothing to do with that.

Q.—So you have no means of knowing the actual output ?
A.—No.

Q.—It is all left to chance ?
A.—Yes.

Q.—You do not know the percentage of solid material dredged and discharged from day to day ?
A.—Yes, when the Surveyor comes he gives us the results.

Q.—Do you watch the results ?
A.—Sometimes we do.

Q.—Do you know the quantity that you dredged last year ?
A.—No.

Q.—You think that the dredger is efficient in every way ?
A.—Yes.

Q.—But it does not give the required output and the only reason you give is the insufficiency of the depth of clay ?
A.—Yes.

Q.—I suppose you have plenty of power ?
A.—Yes.

Q.—Is there more power than you need ?
A.—No.

Q.—Are the cutter blades very strong ?
A.—Yes.

Q.—Supposing you made the blades stronger and you increased the power of the engines do you think you could increase the output of the dredger ?
A.—No, I do not think so.

Q.—Have you ever worked with "Kalu" and "Colaba" together ?
A.—I am on "Sir George Lloyd".

Q.—You pump into "Colaba" but you have never worked with "Kalu" ?
A.—No. "Sir George Lloyd" is with "Colaba".

Q.—Do you expect any difficulty in working three shifts ?
A.—No.

Q.—Do you live on shore or on the boat ?
A.—I live on the boat.

Q.—How many people live on board the boat ?
A.—The whole of the dredging staff.

Q.—You do not go into the cost of dredging ?
A.—No.

Q.—You do not know how much you are spending ?
A.—That is for other people.

Q.—For what period did you get bonus ?
A.—Once for March only.

Q.—If your men are given bonus, do you think they will be able to increase the output considerably ?
A.—No.

Q.—But it has been suggested ?
A.—Yes.

Q.—What percentage do you expect next year ? You have done last season better than the previous ?
A.—I cannot say.

(This concluded the evidence of Mr. Speirs.)

20th Witness

Mr. S. R. Merrett, Assistant Dredging Master, "Sir George Lloyd"

Sir Frederick Hopkinson.—What is your full name ?
Mr. Merrett.—Sydney Edward Merrett.

Q.—You are Assistant Dredging Master, "Sir George Lloyd" ?
A.—Yes.

Q.—How long have you been on "Sir George Lloyd" ?
A.—Seven months.

Q.—What previous experience have you ?
A.—I was five years with the Soudon North-Eastern Railway at Hull, as Dredging Master.

Q.—What sort of dredgers had you to deal with ?
A.—Both bucket and suction dredgers. The bucket dredgers, 2, 3, 4 and 5, 3 and 5 being the double ladder type, 2 and 5 single ladder type. Then to the larger bucket dredgers "Lord Goicey" and "David Dale". Afterwards the 18 inch suction dredger "Brindley" double pumps in parallel.

Q.—Outside the King George Dock it was mostly heavy silt and at Salt end sand very fine at that ?
A.—Yes, Sir.

Q.—Do you know what percentage you get there ?
A.—Take for instance Salt end. There we got 1,600 tons in three hours. We used to fill that with solid material you could walk over.

Q.—You know exactly how much you pumped ?
A.—No, Sir.

Q.—You must lose 25 per cent. of what you pumped. You know what percentage you actually pumped ?
A.—I should say we lost 25 per cent.

Q.—How much do you think you pumped altogether ? What percentage of sand was it to the water ?
A.—I think 10 to 12 per cent.

Q.—Did you take tests with a tube ?
A.—Yes.

Q.—How often ?
A.—Every load, six times a day.

Q.—About the King George dock there was more silt ? Was that near the entrance to the docks ?
A.—Yes, Sir, both east and west jetty.

Q.—Can you tell us what percentage of that stuff you got ?
A.—It was slightly more.

Q.—The mud was so soft that it was really more like dirty water ?
A.—No, like treacle.

Q.—How long did you take to fill your hopper ?
A.—Half an hour. And the percentage in the hopper used to run up to 65 per cent. solid material.

Q.—How did that silt compare with the soft stuff that you have here ?
A.—I think pretty well the same.

Q.—You have heard the evidence given by Mr. Speirs. Do you agree with what he said or do you disagree with it ? Is there anything you disagree with ?
A.—No, Sir.

Q.—Are you satisfied that he has given a fair representation of the difficulties and trials ?
A.—I do not think he has half told you what the difficulties are.

Q.—How does the "Sir George Lloyd" compare as a dredger with other machines you have had control of ?
A.—I think she is the latest, best, and the most modern dredger. As far as I can see it is the best in the world.

Q.—Have you any criticisms to make about her construction ?
A.—No, Sir, I am quite satisfied.

Q.—I was asking you about the mud at the dock entrance. You said it came out like treacle.
A.—It comes out a quarter instead of full bore.

Q.—But you used to fill the boat in half an hour ?
A.—Yes.

Q.—If you had that kind of mud here it would probably choke your delivery pipe ?
A.—You could not use that material because to send it along the pipe line you want a thinner stuff.

Q.—Do you see any objection to working 24 hours a day ?
A.—No, there is no difficulty.

Q.—Supposing a special effort is required. The first thing to decide would be to work twenty-four hours ?
A.—Yes, Sir.

Sir M. Visvesvaraya.—You were getting 10 to 12 per cent. material out of the total quantity of water and water it pumped ?
A.—Yes.

Q.—How much do you get here ?
A.—Here too it is 10 to 12 per cent.

Q.—How have you measured it ?
A.—I am given to understand that an average is from 1,200 to 1,800 per hour.

Q.—When did you join ?
A.—January of this year.

Q.—When you work at the depth of seventy feet, does the pipe run full bore ?
A.—It should do.

Q.—Have you noticed it or does the capacity fall ?
A.—She works best between fifty and seventy.

Q.—What records and measurements do you keep on this boat ?
A.—None whatever.

Q.—You were keeping them at Hull ?
A.—Absolutely.

Q.—Why don't you do that here ?
A.—I am very small here.

Q.—If they ask you, you will do it ?
A.—Do anything to help the work.

Q.—In what respects does the dredging here differ from the work there as regards records ?
A.—One is run by a private company and they want their pound of flesh. If you do not turn over the percentage, you have to make room for some one else.

Q.—Do they measure the silt ?
A.—That is done by a surveyor here. Figures are not available to us.

Q.—Do you think the engine is of sufficient capacity to work the cutter here ?
A.—Yes.

Q.—And is the cutter strong enough ?

A.—Yes.

Q.—What is the reason for the short output ?

A.—That I could not say. I have done my best. I do not think it is the dredger's fault. I want a certain fixed depth of material. Manœuvring takes a lot of time. It is due to the conditions of the harbour which do not exist at Hull.

Mr. Billimoria.—Was the dredger mishandled in any way ?

A.—None whatever.

Q.—Is the staff inefficient ?

A.—Far from it.

Q.—There is nothing wrong with the dredger itself. The reason you attribute for the smaller output is due to the material ?

A.—And the local conditions.

Q.—Have you noticed any difference in the working of the dredger when you have been cutting clay and when you have been pumping mud ?

A.—In the mud you will get better results. In the mud you naturally bury suction head about twelve feet below gauge level. But you cannot do that in clay.

Q.—The first cut you take is twelve feet below gauge level ?

A.—Yes.

Q.—Then the next one is four ?

A.—The first twelve feet cut takes off all the mud, then I take four feet, three feet, and then two feet.

Q.—Obviously if you are taking two feet, unless your cutter is running pretty fast, you are bound to get less material ?

A.—Yes.

Q.—So that you have got your eye on the vacuum gauge and you increase the speed ?

A.—Yes.

The Committee assembled at 11 a.m. on Tuesday the 17th August 1926, the Chairman and all Members being present

Mr. Elgee, Chief Engineer, was called in and examined again.

Sir F. Hopkinson:—I have received from you I think—those are not signed—two statements giving unit prices.

A.—Yes.

Q.—Is this costs for last year or estimates for the future?

A.—These are estimates for the future.

Q.—There is nothing whatever to show that on this list. If I had not asked you that question, I would not have known it. Will you have this written out again and describe them and have them signed, please?

A.—Yes.

Q.—If they are your estimates for next year will you so head the document?

A.—Yes.

Q.—I notice on the dredged filling there is a great discrepancy between your estimate for shrinkage and the Neilson Committee's. They say 40 per cent., you say 15 per cent.?

A.—The difference is, they allow 40 per cent. on the material deposited in the area.

Q.—That is to say, they measure the total deposited in the area and then deduct from that 40 per cent. You on the contrary deduct 15 per cent. from the quantity that has been dredged as measured by soundings?

A.—Quite so.

Q.—Supposing you dredge 100, you call that 85. Theirs has no basis at all?

A.—I have got a comparison here, Sir.

Q.—They assume something, and from that assumption they deduct 40 per cent.

A.—That is so.

Q.—How do they get this assumption?

A.—I cannot tell you, Sir.

Q.—It does not seem to me to have any meaning at all. Do you think it has? Can you understand it?

A.—I should say it was guess work entirely.

Q.—But there is no foundation even for a guess. As a figure it is quite useless to me, because it says that this dredged material is going to make so much filling, and from that filling we deduct 40 per cent. But where do they get the quantity of filling from?

A.—They have measured the filling from sections taken from the area, in one case immediately after the dredging had ceased, and in another case within a few weeks.

Q.—Did they take many sections?

A.—They checked the sections that were taken by my staff.

Q.—You took I presume at the end of the working season?

A.—Yes.

Q.—That dredging material may have been 6 months there. Some of it may have been there for a week?

A.—Yes.

Q.—And so there is no basis at all?

A.—I do not think so. That is why I do not take any consideration of those quantities.

Q.—In the case of Back Bay dredging you deduct 5 per cent. shrinkage?

A.—Yes, Sir. Because the clay is in a very much larger proportion than it is in the south end from the harbour, and there is a much larger proportion of sand.

Q.—Is there any sand in the harbour dredging? Is there ·001 per cent.?

A.—There is very fine sand indeed and a very small proportion not worth mentioning.

Q.—There is practically no mud in the Back Bay dredging?

A.—Very little.

Q.—So little that you can ignore it?

A.—Yes.

Q.—Will you at the same time give a section of the parapet?

A.—Yes.

Q.—These prices for the storm water drains I presume are the prices you would use for the purpose of making your total estimate?

A.—Yes.

Q.—Do these cover superintendence and fixed charges?

A.—Yes.

Q.—These are the prices which, if you were taking a contract, would appear in the schedule?

A.—That is so, Sir, except establishment charges.

Q.—What do establishment charges cover?

A.—They cover the office staff and the Deputy Chief Engineers and the Assistant Engineers.

Q.—I thought these were included in superintendence?

A.—That includes subordinate staff. All the superior officers are included in this.

Q.—In the second page you give us costs of cement, sand, rubble, etc. Is not the first date 1923-24 wrong?

A.—I think that ought to be 1922-23.

Q.—Are these the prices you have actually paid for cement?

A.—Those are the prices we have been charged by the Department.

Q.—Does the Department make a profit out of you?

A.—I believe they do. Those are the prices we are charged. The cement is purchased by the Department for the whole of its requirements. It distributes the cement to us and charges us a certain price.

Q.—So that you are not a free agent in buying your own cement?

A.—No, Sir.

Q.—These prices may include establishment charges for the Directorate?

A.—Yes.

Q.—In fact they may include anything?

A.—They may.

Q.—Have you any idea how these compare with the market prices at any time?

A.—The market prices are much lower.

Q.—If you are carrying out the works separately your costs would have been lower?

A.—They would have been.

Q.—I take it the price of sand, Rs. 6-1-0 is the price delivered on the works?

A.—Yes.

Q.—With regard to the rubble and crushed stone you give us the costs at the quarry. What does that include?

A.—That includes the whole of the overhead charges at the quarry.

Q.—Will you give that on the note?

A.—Yes.

Q.—Fuel oil does not include duty. Will you put on what the duty is?

A.—We do not pay the duty.

Q.—You can find out?

A.—Yes.

Q.—This scheme ultimately pays duty, does not it, or are you exempt from duties?

A.—The Government of Bombay get a rebate. I am not quite sure what becomes of that.

Q.—Did you pay duty originally?

A.—No, Sir.

Q.—All materials and plant for this work are imported free of duty?

A.—Yes.

Q.—We have been told that the " Colaba " was laid up for 17 working days last year for the vibration?

A.—It was not 17 days. The " Sir George Lloyd " was delayed 17 days due to the " Colaba " being laid up. That was occasioned by the alterations in the pipe lines. The " Sir George Lloyd " was brought close to shore and the whole of the pipe line was disconnected as a consequence of the " Colaba " being laid up. It was 17 days' loss of time for the " Sir George Lloyd."

Q.—Can you tell me how long the " Colaba " was laid up?

A.—From the 12th November 1925 to the 24th March 1926.

Q.—And consequently during the whole of that time the " Lloyd " had to work alone?

A.—Yes.

Q.—How do you account for the " Lloyd " doing so much better work last season than in the previous season? She was doing " Colaba's " work as well as her own. The working period is 7 months. For more than half the time the " Lloyd " was working alone. Does not that rather point to the desirability of letting the " Colaba " alone for all time?

A.—No, Sir, without the " Colaba " the " Sir George Lloyd " would not be able to pump ashore from a long distance.

Q.—What distance was the " Lloyd " pumping alone?
A.—From 5,900 feet to 7,813 feet.

Q.—And at the same time your output was better than in the previous year when they were working together?
A.—When she was working 7,813 it was only 416 yards an hour. That is our measurement from the soundings in the harbour.

Q.—You know, Mr. Elgee, that the effort of a pump in driving water through a horizontal pipe is very very slight that nearly the whole of the work done in a pump is in lifting?
A.—Yes, I agree, in a short length of pipe. But in a long pipe the effort is proportionate to the length.

Q.—I have had some figures given me extracted from one of your log books. The pumping days of the " Lloyd " last year was 167?
A.—Yes, Sir. That is correct.

Q.—And the pumping days of the " Colaba," 66?
A.—Yes, of the " Colaba ".

Q.—Has it ever occurred to you that you may be suffering from an air-lock on the " Colaba " in the suction pipe?
A.—I have thought so.

Q.—Then why not put in a hole there at once.
A.—I did not do that.

Q.—Do you know that a centrifugal pump is helpless when it gets in air in the suction pipe?
A.—Yes.

Q.—You have thought it possible there might be an air lock in the suction pipe?
A.—Yes.

Q.—But you have not done anything to remedy it up to the present?
A.—No.

Q.—One of the Dredging Masters told us yesterday that the Dredger stopped for meal times. Do you not think that could be obviated?
A.—It could be, Sir. But they do the oiling round during the meal time.

Q.—The pumping engine is almost identical with the propelling engines, is it not?
A.—But there are winches and things require oiling.

Q.—I suggest to you that you ought to eliminate the loss due to stopping for meal hours?
A.—We can try that on the " Sir George Lloyd," but on the " Kalu " you have to stop at intervals. We have to rake out the grates, and clear the ashes out. They have to stop for that.

Q.—Why is it necessary to stop to clean the grater?
A.—Because of the accumulation of ash.

Q.—In the case of ocean going ship you do not stop for cleaning out the fires?
A.—There is not exactly the same coal and also the appliances are not the same on the " Kalu " as on an ocean going steamer.

Q.—Would it not pay you to make the appliances the same? You have got an extremely expensive dredger with an expensive outlay. Even moment of the time is valuable to you.
A.—I quite understand that.

Q.—I think you ought to make mechanical arrangement to get rid of your ashes. One of your engineers told us yesterday he lost 4 hours a day in cleaning out the pipe.
A.—That would be about 2 hours for each shift.

Q.—That is 25 per cent. of the time. Have you got the cross sections plotted for the harbour dredging?
A.—The sections you asked for the other day of Mr. Kidd's borings are being plotted.

Q.—Can you put on this map the site and particulars of your borings in the Back Bay?
A.—Yes, I can put them on.

Q.—And at the same time give some cross-sections?
A.—Yes.

Q.—In Sir George Buchanan's sections he shows on Plan No. 3036 a cross-section of the dredging in the harbour. There is cross-section No. 1 in the plan. Do you know how he got that?
A.—I cannot tell you, Sir.

Q.—Do you think it is plotted from Mr. Kidd's borings? There is no such section in Mr. Kidd's papers. There are also cross-section No. 2 and No. 3. This cross-section No. 1 shows that the material consists of from 3/4 to 7/8 of blue clay and very little mud.

A.—Yes.

Q.—Again there is cross-section No. 2 in the middle of the dredging area. This shows that the bulk of material is hard as distinguished from mud.

A.—Yes.

Q.—It shows a surface of mud, and then another line underneath, a surface of hard bottom.

A.—Yes.

Q.—Is it not clear from that that none of the borings went into the clay?

A.—This might mean there was a hard bottom of moorum and the overlying material is mud.

Q.—That might be clay or that might be moorum. There is nothing on that cross-section to show that the material to be dredged is clay at all?

A.—No, Sir.

Q.—It may be rock.

A.—It might be.

Q.—There is nothing to show that his boring went anywhere near the 70 feet?

A.—Nothing.

Q.—Now look at Section No. 3. It is identical with No. 2 and shows that the bulk of the material to be dredged is seven-eighths at the least of hand material.

A.—Yes.

Q.—It is something other than mud, but does not say what it is?

A.—Yes. You have to dredge down to 70 feet.

Q.—If you do not get to 70 feet, you cannot get your 75 million yards?

A.—No.

Q.—Your section will show exactly what this line is described as?

A.—Yes.

Q.—Obviously from that section it was intended to get the whole of that hard bottom material?

A.—Yes.

Q.—From those cross-sections as given by Sir George Buchanan is it not clear and obvious that any one starting the work of dredging would have no idea of what he was going to meet below that so-called hard bottom line?

A.—Yes, Sir, it is clear.

Q.—In Mr. Kidd's report I notice he gives the area for dredging as 17,400 feet by 9,000 feet, *i.e.*, over 3 miles long and nearly 2 miles wide?

A.—Yes.

Q.—Have you ever contemplated dredging over that area?

A.—This is 12,000 feet here (measuring the plan with a divider).

Q.—Mr. Kidd has taken 5,400 feet from somewhere else. If he takes 17,400, he is going quite outside the limits you have got on that plan?

A.—That is 12,000 feet long and 4,000 feet wide (measuring it again on the plan).

The Chairman.—In the correspondence with the Port Trust the Director put the figures of 12,000 and 4,000 feet.

Sir Frederick Hopkinson.—Is there any plan of Mr. Kidd's showing that area of 17,400 by 9,000?

A.—None that I am aware of.

Q.—Is it shown on the borings plan?

A.—It is outside the 12,000 feet area.

Q.—That plan of Mr. Kidd may show the length of 17,400 feet?

A.—Yes.

Q.—I should like to know which end of the dredging area?

A.—It is in this area (showing it on the plan).

Q.—Have we anything to show the area selected by Sir George Buchanan in 1919 for his dredging area?

A.—I think this plan here (showing the plan) shows the exact boundary that he relied on.

Q.—Did he settle his boundary line?

A.—That is his boundary line (pointing to the plan).

Q.—That is the area which he decided that the dredgeable material was to comes from?

A.—Yes.

Q.—Where did the " Sir George Lloyd " first start work?

A.—She started in block K.

Q.—Did she finish that block?

A.—No, not in the first season. She was working in block K the whole of the first season.

Q.—The second season?

A.—She started work in block J for the second season.

Q.—How many blocks did she do in the second season?

A.—She did areas in blocks J and H.

Q.—Who is responsible for these quantities shown in the various blocks?

A.—Those were taken out by Mr. Lewis.

Q.—Were they taken out from Mr. Kidd's cross sections?

A.—I believe so.

Q.—In fact you have no other information but those supplied by Mr. Kidd?

A.—That is all.

Q.—The totals given on this plan in the various blocks A to K amount to 36 million cubic yards?

A.—Yes.

Q.—The quantity the Port Trust prohibited you from dredging is 15½ millions. That left you 20 millions?

A.—That is so.

Q.—That of course is not sufficient to complete the reclamation?

A.—No.

Q.—And it was ultimately decided that you should widen out here (showing in the map) by these four strips 250 feet wide and 1,000 feet long?

A.—Yes.

Q.—What is the material in those four strips? Did you take any borings?

A.—No

Q.—You never had any dredging on them?

A.—I think we did some outside of this place. But it is not worth speaking of.

Q.—Out of the 35 millions there is according to this plan less than 11 millions of clay?

A.—Yes.

Q.—So that more than two-third of that material is mud?

A.—Yes.

Q.—The three sections made by Sir George Buchanan show that at least seven-eighths of the material is hard?

A.—Yes, and that is dredging up to 70 feet depth.

Q.—You notice that in block K it is all mud?

A.—Yes.

Q.—Also in block G it is all mud; block J is about 3 of clay and 4 of mud; block H is 3 of clay and 42 of mud; block F is all mud; block E is 2 of clay and 25 of mud?

A.—Yes.

Q.—So that over those areas for some time the material you will get will be practically all mud?

A.—Yes.

Q.—Does it not follow from that that nearly the whole of the area of reclamations is mud?

A.—I do not know that these quantities can be relied on. As a matter of fact some of the best material we have got is from block K, whereas this plan shows that there was no clay in block K.

Q.—You have not gone down to 70 feet?

A.—No.

Q.—What is your suggestion, is it that the boring is wrong?

A.—I think he must have gone into some of the faces having hard material.

Q.—There is no clay shown on those cross sections. It is only mud and then hard material which must be clay?

A.—Hard material may be moorum or rock or clay.

Q.—That comprises seven-ninths of the whole, and as the dredger was ordered and designed to dredge soft clay, where does it come?
A.—I do not know.

Q.—It is obvious that the hard bottom is clay?
A.—I think so.

Q.—We shall see better when we get the cross sections. Apparently in those sections of Sir George Buchanan the borings never went below the surface to what he calls the hard bottom. Therefore, if those borings are accurate, nobody knew what there was below that line?
A.—No.

Q.—Neither Mr. Kidd nor Sir George Buchanan?
A.—No.

Q.—The explanation of the difference between the 75 million yards as given by Mr. Kidd and the 35 millions shown on this plan appears to be the constitution of this area?
A.—Yes.

Q.—Is it possible that the small output of the dredger is due, not to the hardness of the clay, but to the softness of the mud? I want you to think over that very carefully?
A.—Yes, that is very probably so.

Q.—We have been told by all the Dredging Masters that the cutters have no difficulty in cutting the clay and they all agreed that they cut it well. But all carefully excepted the last 18 inches. Otherwise you agree?
A.—Yes.

Q.—The cutters on the " Sir George Lloyd " have never been worked to their full power?
A.—I think they have.

Q.—One of them told us that the horse power of the engine was 400 and that was never worked?
A.—I have seen on board that the cutter has stopped.

Q.—That is at the bottom, not in the upper part?
A.—Yes.

Q.—There is nothing to show that the cutter did not cut?
A.—No.

Q.—Would you give a correct description of the mud when once it has been dredged or broken up? Do you think it would be fairly correct to say that the kind of material as deposited in the reclamation area has been little more than dirty water: would that be a fair description?
A.—Yes, I think so.

Q.—And consequently the percentage of solid matter would be much smaller than in the case of sand or any other heavier material?
A.—Yes.

Q.—Had the mud been stiffer or been sand, do you think it probable that the " Sir George Lloyd " would have done 2,000 yards an hour?
A.—I believe so.

Q.—And that the whole difficulty has been due to the fact that the mud is so impalpable that it is impossible to get a reasonable percentage of solid matter for pumping in?
A.—I believe that is one of the reasons.

Q.—Sir George Buchanan in his specification for a pump described the material as soft clay. Mr. Kidd in his report calls it stiff unctuous clay. Which description do you agree with?
A.—I think Kidd's description is probably the more correct.

Q.—Would you call it soft clay? Supposing you had come to investigate the matter and you had some of the material dredged out by a grab and you saw it came straight out of the face, would you call that soft clay?
A.—The term of soft is hard to describe, it is comparative. It is a case of taking borings, and I would go by the speed at which the boring is carried out and so on.

Q.—It is a very loose expression?
A.—Yes.

Q.—On the other hand Mr. Kidd's expression is one that I have never previously heard. Do you think you could possibly find a better description of this clay than the term " stiff and unctuous "?
A.—I think that is a fairly good description.

Q.—My question was, could you give me a better description?
A.—I do not think that I could.

Q.—I presume that you have no knowledge as to the reason why in the specification for the dredger the material to be dredged is described as soft clay?
A.—That I cannot say.

Q.—You think if it had in fact been softer clay than it is, the cutters would have done more?
A.—I think it is possible.

Q.—Do you think it probable?
A.—I would not like to say that it would be probable.

Q.—I have been very much struck by the unanimity of all the dredging masters in saying that the speed of the cutter has been regularly constant, that the cutter engines have never had any trouble at all in making the necessary number of revolutions. And so, had it been softer, could you have taken a deeper cut?
A.—Yes.

Q.—Why, where is the room? Won't you take the maximum cut with the cutter?
A.—I should think that we get deeper if the material were softer.

Q.—My point is about the cutting. Would you take more in soft clay than in hard clay? Is there a limit beyond which you cannot go? A cutter is really a planing machine, and you cannot put one blade to cut 6 inches and then another for more than 6 inches?
A.—No.

Q.—Supposing you had been sent out in 1919 to investigate the scheme and prepare an estimate for a contractor. As has been stated, this is one of the largest pumping reclamation works in the world. Would you not have thought it prudent to take extensive samples of both the clay and the mud to submit to the people who are designing the pumps?
A.—Yes.

Q.—Would you think it an absolutely essential thing to do?
A.—Certainly.

Q.—If you had not done so, would you not be showing that you did not understand your work?
A.—Yes.

Q.—Do you know if that was done?
A.—That I cannot say.

The Chairman.—There is no indication of any document that it ever was.

Sir Frederick Hopkinson.—Do you not think that in fairness to the builders of this enormous dredger this information should have been supplied to them?
A.—Certainly.

Q.—Otherwise had they designed unsuitable machinery, their reputation would have suffered very greatly?
A.—That is so.

Q.—In making your estimate for the morrum filling, have you assumed that you would get your material at Kandivli?
A.—Not at Kandivli itself, but in the neighbourhood.

Q.—Within reach of the existing sidings?
A.—That is so.

Q.—Your estimate is a limited one for a limited quantity, and you don't say that it is an estimate that can be applied for the whole work?
A.—No, Sir.

Q.—When it was decided to take "Kalu" into the Back Bay, was it explained to Sir George Buchanan that there was not water enough for her to float?
A.—I think he must have understood it, in any case from the charts.

Q.—Was not a suggestion made in one of his letters that you should hire a bucket dredger from the Port Trust to make her a berth?
A.—I think there was a suggestion either for a bucket dredger or a grab dredger.

Q.—Did you act on the suggestion?
A.—No.

Q.—Do you think for a moment the Port Trust would have allowed the bucket dredger to go there?
A.—I am certain they would not.

Q.—You think it would not be prudent to do so?
A.—No.

Q.—Did Sir George Buchanan ever suggest that this dredging for floatation purposes was essential? Did he suggest how it ought to be done?

A.—I think the first plan Sir Buchanan had in his mind was to dredge the channel from the outside, from the reef inwards.

Q.—What distance?

A.—Roughly I should say, within two miles.

Q.—And what is he going to do with the material?

A.—Going to deposit it ahead so as to pick it up later on. I think that was the idea.

Q.—But your suction is ahead of you; you could not deposit it ahead?

A.—We have a plan showing that the dredger in the channel was prepared to go in ahead.

Q.—Going in stern first?

A.—I do not know.

Q.—Would you let me see that plan?

A.—I can show you.

Q.—Was any estimate sent to you as to how long the two mile channel would take to dredge?

A.—The distance is on the plan. The dredging area (referring to the plan) would have been 5,000 ft.

Q.—About one mile long?

A.—Yes.

Q.—And you deposit the material in front?

A.—Yes.

Q.—So, Sir George Buchanan was kept fully advised of the progress of the works?

A.—He was.

Q.—Of all the difficulties met with?

A.—Yes.

Q.—Did you send any weekly reports?

A.—Yes.

Q.—Full details?

A.—Yes.

Q.—So that in London he ought to be able to understand a fortnight after the event exactly what had been done here and what you were going to do for the future?

A.—He had a special plan marked in squares, which were numbered, and we could refer to the particular number and the section in which the dredger was working at any time.

Q.—In the letter from Sir George Buchanan, dated 5th June 1924, he writes under the head " Kalu " : " We adhere to our opinion that whatever the future decision respecting the cables in Back Bay, the ' Kalu ' should begin work next season in the area north of the cables and coloured pink on our drawing No. 3496," (Is that the drawing you referred to showing the channel? If not let us have 3496) " and in order that the work may be commenced by the ' Kalu ' without an intermediate pumping station we recommend that the vessel be taken at high water to the nearest point to the new sea wall (see sketch attached). She would go to this position at high water and would then either dredge a hole for her own floatation or float in a hole previously prepared by the Priestman Grab Dredger. We have considered this matter very carefully and can see no difficulty, as when the ' Kalu ' and ' Jinga ' were working on the Sewri Reclamation, the first operation was to take the dredgers at high water and place them in a position where they had to dig their own floatation before they started work, and we understand the digging of the whole took about three tides ".

Is it a fact that the digging of a hole for the ' Kalu ' by herself took nearly three months?

A.—The first season.

Q.—The whole of the first season?

A.—And then we did not get sufficient depth. We were in the position shown in the drawing.

Q.—Is it possible to compare the two operations, on the Sewri Reclamation and on the Back Bay?

A.—No.

Q.—They are entirely different?

A.—The materials are entirely different; because in Sewri Mazgaon you have got a very soft bottom. In the Back Bay the Kalu would meet with injury if she has not sufficient depth.

Q.—She would probably have been lost if she had landed at low water there?
A.—Yes.
Q.—Have you read Mr. Kidd's report of 1912?
A.—Yes.
Q.—Does he not explicitly say there that the Back Bay had been thoroughly investigated as it seemed a most suitable place to get the material from for the reclamation, that it was quite impossible to get it owing to the nature of the material, rocks and pockets of soft material? I suppose you agree with that?
A.—Yes. Personally I would not have advised the ' Kalu ' being put into the Back Bay at all on account of the shallow face.
Q.—Who decided that the ' Kalu ' was to go there?
A.—Sir George Buchanan and Lewis.
Q.—Between them, or did the one propose it and the other agree to it?
A.—It was Mr. Lewis who proposed it at the first instance and Sir George Buchanan afterwards approved of it.
Q.—Did Mr. Lewis put up a complete statement showing the borings, the thickness of the dredging available?
A.—Yes; in one of his letters.
Q.—Did he put before Sir George Buchanan the physical conditions of Back Bay?
A.—Yes.
Q.—Notwithstanding that, he suggested that it should be done?
A.—That is so.
Q.—Sir George Buchanan would have that opinion presumably before he had agreed to its being done?
A.—Yes.
Q.—Turning to page 47, there is a letter dated 1st May 1922. He says in that letter " As regards boring in Back Bay, we have got fairly good results, but I am afraid the plant we improvised is not powerful enough to get through anything at all hard." What does he mean by " at all hard "? There would not be vast material there to come under that description?
A.—Yes.
Q.—Therefore it means no results at all?
A.—I think that referred to wash borings.
Q.—Then he says ' For many small jobs, we shall require a grab dredger on a pontoon with a crane and it seems to me that we might get better results by grabbing out instead of trying to make wash borings '?
A.—Yes.
Q.—In the same letter he has told Sir George that wash boring is no good at all and ' another alternative for boring naturally would be to get a small pontoon with spuds and on the pontoon convey a proper core drill.' That is the alternative he suggests. This was in 1st May 1922, and presumably to do any good, the dredger ought to have started in November?
A.—Yes.
Q.—Would it have been possible to do that?
A.—Not before November of that year.
Q.—It was in November of that year they were proposing to start the work?
A.—Yes. The proposal was to start originally in the harbour in November 1922. I do not think there was any idea of Back Bay then.
Q.—This letter was in May 1922; it was really making a proposal to alter the whole scheme of doing the work?
A.—Yes.
Q.—The whole original scheme was to fill the Back Bay from the harbour?
A.—Yes.
Q.—And can you give me any idea as to why in May 1922 they should want to abandon that scheme on which they spent nearly a million pounds? Do you know what is the reason for going to the Back Bay at all?
A.—As far as I understood it then, it was because they did not think there was sufficient material to be obtained from the harbour within a reasonable and economical distance.
Q.—But have you got enough on that plan? It is to get 20 millions there.
A.—That 20 millions was not sufficient for the whole.
Q.—You have got an extra width, you have got any quantity there without going any further away?
A.—If you have got the full quantity it would be unnecessary to have gone much further out to get the material, and also to get to the northern end it would have been almost impossible to pump material from the harbour.

Q.—This added strip is immediately on the other side of the blocks we have been talking about and is at no greater distance than the northern blocks?

A.—But they would not have filled the northern end, I think it would have been impossible to fill the northern end from anywhere else.

Q.—Impossible with the dredgers at your command?

A.—Yes, because it is very expensive to put pipe lines across the city.

Q.—Of course it would be a mad brained scheme to run a pipe line across the centre of Bombay?

A.—I think that was the reason; they wanted to obtain material for the blocks 1 and 2 from the nearest end.

Q.—It was not possible to fill blocks 1 and 2 from the dredging area in the harbour?

A.—That is so.

Q.—Therefore the scheme as a scheme absolutely broke down?

A.—Yes.

Q.—This dredging in the Back Bay is the only possible way of getting over something which they had not seen in 1919?

A.—That is so.

Q.—If they had been in 1919 provided with these dredgers they could not do it?

A.—No.

Q.—You have this letter here, dated 10th May 1922, in which he says that the borings show that there is a layer of sand and clay varying in depth from 4 feet to 21 feet on an average?

A.—Yes.

Q.—If you had got to dig the whole of that soft material it would mean you would be in constant dread of your cutter touching rock?

A.—Yes.

Q.—If indeed the thickness of the clay varied from 4 to 21 feet it would have meant that you would be in constant fear of running up against one of those 4 feet depths and rocks?

A.—Yes.

Q.—And with the probability of smashing the cutter?

A.—Yes.

Q.—And having smashed your cutter your vessel will be laid up for some months?

A.—Yes.

Q.—And therefore you consider it a highly risky thing to do?

A.—It is not so much now, now that we have a reasonable depth of face and depth of water.

Q.—But you cannot get over this 4 feet depth of harbour?

A.—That is in certain areas, but we know the areas where the vessel is working now, that has been pretty well explored.

Q.—And you are satisfied that you can work there?

A.—Work there with comparative safety.

Q.—9 to 10 feet in depth?

A.—Yes.

Q.—That is as much as you can get?

A.—We might get more in some places, but on an average it would be about 10 feet of material and we will have about 14 to 16 feet at low water.

Q.—This is a very important matter. They should have known in 1922 how much dredgable material there was.

A.—Yes.

Q.—But I see Mr. Lewis in his letter says that he has discussed this question with the Director and he suggested that he might perhaps carry out our investigations further with the aid of a suitable grab dredger or by using a core drill and by discussing this with you in London?

A.—Yes.

Q.—Is that the way to manage a large work of this kind and is it possible to carry on works on such lines satisfactorily?

A.—No.

Q.—Alternatively, he says core drill would give accurate information on any particular spot. What does that mean?

A.—He was referring to core drill.

Q.—You do not want rock drill?

A.—That was not necessary because it was no use there.

Q.—On the 22nd June 1921 (that is to say before anything was done here) Sir George Buchanan, in writing to Mr. Lewis, heads the paragraph " Possibilities of dredging material for reclamation from Back Bay ", and says " We have always held the view that there is so much rock in Back Bay and in many cases near the surface, that it would be impracticable to use a suction cutter dredger on a large scale. You might get a considerable quantity of material in pockets by means of a grab dredger loading into barges, but it is probable that the cost would be heavy ". I should like to interpellate here. Can you give me an idea as to why he uses the word " probable "?

A.—No.

Q.—What word you would use?

A.—" Certain " would be the word.

Q.—Then he says " Alternatively it is possible that a certain amount of material in the locality marked with on an enclosed plan No. 3257 might be made available by dredging with the ' Kalu ' or even with the big dredger for reclamation of the northern area, and we certainly think will be worth while taking the borings to ascertain the position of the rocks; if you could reclaim a portion of the northern section by this means it would be much cheaper than by taking it from the harbour."

So that apparently, he was going to do it on the score of economy; not because he could do it from the harbour with the two dredgers that were provided. Is there anything in your experience to show that this is an economical way of filling as against taking it from the harbour.

A.—It is difficult if you attempt to get material from the harbour. The difficulty lies in the length of the pipe lines which would probably decrease the output from the harbour. Therefore the shorter distance to the Back Bay from the northern blocks would probably compensate for the difference in length from the harbour to the northern side.

(The examination of Mr. Elgee was continued at 12-30 noon on the 17th August 1926.)

Q.—In the same letter you go on to say, " I may say that we do not accept without more information Mr. Mitchell's very pessimistic view of the nature of the material we shall get from the Harbour as we hope there will be a great deal of hard clay that will require very little moorum topping." Who is Mr. Mitchell?

A.—Mr. Mitchell is an Analyst and carried out tests. He was with the firm of Stanger and Blount.

Q.—Do you think Mr. Mitchell can see further into this clay than you can?

A.—I do not know what Mr. Mitchell's opportunities had been or what his previous experience was.

Q.—The question is simple. Do you think he can see further into the clay than you can?

A.—No. .....

Q.—Do you think he can see into the clay?

A.—He has taken the specific gravity .....

Q.—That is only after he took the sample. He cannot tell? The only way is by taking borings. These borings were taken 6 or 5 years before and he says " there will be a great deal of hard clay." Didn't he know that there was going to be hard clay from Mr. Kidd's borings which he accepts?

A.—He ought to have known.

Q.—On the 7th of July, in the same year, Messrs. Meik and Buchanan reported about the sealing of moorum topping. That being so, Sir George Buchanan's project estimate dated September 1919 allowed for 1,919,000 cubic yards of moorum. That is the amount necessary to cover the whole area of reclamation one foot thick and also provide for some additional moorum on cross bunds and behind the mass concrete wall at Colaba. At that time, the dredging was all going to be done in 5 years and the whole scheme finished off at once?

A.—Yes.

Q.—That being so, they will have to put this one foot moorum on the top of dredged mud?

A.—Yes.

Q.—The whole of it would disappear after a few weeks into the mud. If you allow sufficient time this mud will dry out and carry the moorum?

A.—Yes.

Q.—In order to complete the works in 5 or 7 years you cannot wait till it is dried out?

A.—If you get one block filled and then leave it for a season to dry out, it will be possible then to cover it over with a foot of moorum. It would be progressing season by season, block by block.

Q.—Beginning at one end and finishing at the other?
A.—Yes.

Q.—In the same letter, they go on to say " until the nature of the dredged material is ascertained by actual experience, it is useless to attempt to estimate the total quantity of moorum required." Was not the nature of the dredged material ascertained by the borings?

A.—No. I could not; I don't rely on borings.

Q.—But in dredging to a depth of 20 feet of material you must reach clay?
A.—Yes.

Q.—Mr. Mitchell took tests. Could not he tell you all about it?—the nature of the material? Can't you test?

A.—With clay it is possible.

Q.—And with what it is not possible?
A.—With other materials.

Q.—Which other materials?
A.—With different kinds of earth.

Q.—There are only two kinds of earth, mud and clay?
A.—The washborings .....

Q.—I was not speaking of washborings, but of the hard core of it?
A.—You can.

Q.—That is from actual experience it would be good for dredging?
A.—Yes.

Q.—That means that at this date in 1921 after the dredger was ordered it was useless to attempt to estimate the quantity of moorum required, because they didn't know the nature of the dredged material, is that so?

A.—That is stated so.

Q.—On page 2 of the Development Directorate's report for 1924 there is this paragraph. The material obtained proved to be of much better quality than had been anticipated, being a hard, heavy clay with sand. That is apparently in the Harbour because it is connected with the remark about " Sir George Lloyd." Would you spend, as a business man, over a million pounds in the purchase of dredging plants 4 years before you proved what kind of material you had to deal with? Does not this all boil down to the fact that when the dredger was ordered Sir George Buchanan knew no more of the nature of the materials in the Harbour than was given by Mr. Kidd's report?

A.—It does.

Q.—That no attempt had been made to prove or in any way to check Mr. Kidd's borings and soundings between the dates of the acceptance of Sir George Buchanan's estimate in 1919 and 1924?

A.—No, Sir.

Q.—There have been 5 years during which no attempt had been made to prove conclusively the nature of the material that had to be dredged?

A.—The dredging began in 1923. That proved the material.

Q.—I don't call that an attempt. There was nothing in the nature of borings?
A.—No, not in the Harbour.

Q.—I am speaking of the Harbour, because the Harbour was the potential area containing the whole of the material for making up the reclamation as far as was known in 1919 and the dredging from the Back Bay is a subsequent innovation?

A.—That is so.

Q.—I notice that Sir Alexander Gibb in his report states that the moorum cost compares favourably with the dredging. Do you know on what he based that remark?

A.—I think at the time that he made his report he was basing his dredging figure on the output of the season 1924-25 which was 19 annas a yard.

Q.—Can you tell me what the price of moorum was?
A.—I believe it was Rs. 3.

Q.—You don't call that favourable?
A.—I mean Rs. 3 a brass for moorum.

Q.—It has been proved by your own knowledge and by the other investigating committee that the cost is Rs. 1·57 per cubic yard.

A.—Per yard. But I don't know whether he mentions that figure in his report.

Q.—The expression he uses is " that the moorum cost compares favourably with the dredging "?

A.—I think afterwards when Government asked for further particulars after they had received his report, he gave the price as Rs. 3 a brass, which would be somewhere about 12 annas.

Q.—That being so, 1·57 is about 25 annas?
A.—Yes.

Q.—Do you know where he got this information from?
A.—I think he guessed it, because they didn't think it was possible to get it done anywhere for that price.

Q.—Did he inquire from you at that time what your moorum was costing you?
A.—I believe he had that information.

Q.—I want to try and find out how he converted that information that his dredging cost 19 annas based on your first year's experience, 1924-25 experience, and 25 annas for moorum, to say that moorum compares favourably with dredging. Do you think it is a misprint for " unfavourably "?
A.—No, Sir. He did not explain the figures exactly afterwards. That was verbally explained in the Secretariat. Mr. Cowasjee Jehangir asked Sir Alexander Gibb to come and have an interview to discuss his report, and Sir Alexander Gibb, Mr. Stileman and Mr. Bell, Secretary to the Development Department, and myself were present. One of the questions was how he arrived at the price of Rs. 3 a brass. He passed it off with the observation that he put in that price because he knew his report would be published and that it was likely to influence any contractors who tendered for block 2 and induce them to put in a very low figure for moorum.

Q.—Taking a long view in the interests of Government and not giving them the facts they wanted?
A.—That is so.

Q.—He was putting politics in front of business?
A.—You may put it that way.

Q.—I noticed when I was in the Marine Line ends the other day that the parapet seemed to be higher than the existing ground?
A.—It is not proposed to raise the ground level of the present area except for the Marine drive.

Q.—What is your definite programme for the next season? Have you got one?
A.—Yes, if the works are allowed to go on, my programme is for the Harbour dredging to start, filling into block 7. Before doing that we have got to seal the wall and also start the cross bund. In the matter of cross bunds, my proposal is to tip the bank in order to seal the storm-water drains. Probably 30 feet wide at the top we anticipate to start with and then fill up the block as far as we can with dredging and afterwards widen out the banks to a width of about 120 feet. The storm-water drain No. 2 is already completed. The preliminary work for next season would be to start at once sealing the wall and also making preparations for the cross bunds.

Q.—But you can't do it without orders from Government?
A.—Yes.

Q.—Till then you are marking time?
A.—Yes.

Q.—What do you propose to do at the other end?
A.—I propose to continue the filling of a portion of block 1 by means of motor lorries.

Q.—What will that cost?
A.—We have got the contract at a low figure. It costs Rs. 2-2-6 a brass.

Q.—How much has he paid for the privilege of putting it in?
A.—Nothing. But he provides motor lorries.

Q.—What else?
A.—I propose to dredge from Back Bay with the " Kalu " at the beginning of the season, put her into the berth where she was dredging last season and as she works during the season we will have to bring the " Jinga " into commission, because the length of pipe line would be getting rather too long and I propose to work the whole of the season into block 1. Then there is the completion of the storm-water drain No. 7. We are doing that now, and will then carry on with storm-water drain No. 6 at block 2.

Q.—How long will it take,...this season,...two years?
A.—No, it will take about one season and a half of the following season.

Q.—There is no urgency to begin that storm water drain No. 6.
A.—No. 6 is rather difficult. We are going on with it because it is the deepest drain and we get the fewest tides to work on it.

Q.—The work for the coming seasons consists of dredging, moorum and going on with 2 storm-water drains?
A.—Yes.

Q.—Nothing else?
A.—Nothing else.

Q.—A comparatively simple, easy job?
A.—Yes.

Q.—Requiring nothing in the way of plant, except the dredging plant?
A.—And the wagons.

Q.—Have you had any instructions to make any investigation in the district of Kandivli to prove the existence of large quantity of moorum?
A.—We are at present making trial pits over an area which has been notified. Several hundred acres have been notified.

Q.—Notified for purchase?
A.—For purchase on certain terms.

Q.—For a hundred acres?
A.—More than that. I will get the exact amount.

Q.—Do you think the money would be well spent?
A.—Yes.

Q.—Assuming you get a good area will it give you 20 feet depth?
A.—That is doubtful because the machines we have at present are unsuited to do the work required.

Q.—Have you persons who know something about the modern excavating plants?
A.—Yes.

Q.—Who have got some experience of the drag-line scrapers so as to take out material from any depth you require?
A.—Yes.

Q.—Don't you think that with a clear face and a machine like that you will get an increased output of even harder material? Do you agree with me that you have not got the proper kind of machine?
A.—Yes.

Q.—And that the machines you have got are under the circumstances useless for the purpose?
A.—Yes.

Q.—The rock varies so much that it would be leaving either soft stuff in or require blasting which would be impracticable and too costly?
A.—Yes.

Q.—That the machines are totally unsuited to do the work required?
A.—Yes.

Q.—That the drag-line scraper will go down to a depth of 30 feet, 40 feet from the existing surface, and you can get all the soft material and that there is not much expenditure incurred?
A.—Yes.

Q.—You have given us the particulars of the estimated cost of the dredging for the next season. Before you finally finish I would like you to carefully consider the increased cost likely to be caused by the use of the "Jinga", because you must remember that she is the sister ship to the "Kalu" and with the exception of the ladder and the manœuvring she has as much to do as the "Kalu".
A.—I made allowance for that because the cost of machinery will be very nearly double next year of what it has been last year.

Q.—Turning to page 129 (pamphlet entitled "Correspondence with Messrs. Meik and Buchanan *re* the execution of the works") we find there a letter from Messrs. Meik and Buchanan about Back Bay in which they say, "We cannot say that we are surprised at the figures of quantity, as calculations made sometime ago in this office showed that at the present rate of progress the reclamation would be completed in 35 years". Do you know if at this time the attention of the Government was called officially to this?
A.—I could not say that.

Q.—Do not you think that Government ought to be informed that completion of the scheme was going to be delayed to that extent, *i.e.*, about 5 to 6 times more than originally estimated?
A.—That does not come under my province. The Director would have known about that.

Q.—In July 1924 that letter would come to you?
A.—It came to me but the Director saw all the letters.

Q.—Did you call the Director's attention to it?
A.—I think the Director was aware of it.

Q.—Do you know if he informed the Government of it?
A.—I could not tell you.

Q.—Do not you think it is such a startling statement that the Government's attention should be drawn to it immediately? Do you not think it is a very grave statement?
A.—It is, but then he is basing this letter on the one season's output.

Q.—This is a letter dealing with the total quantity?
A.—That is at the end of first season's dredging.

Q.—What did Sir George Buchanan subsequently do in consequence of that statement that the work was going to take 35 years, that is to say, when he came out in the following December, did he say anything about this statement?
A.—No, not about this particular statement. I think it was more in the nature of a remark that if we went on at that rate it would take 35 years. That was a hint at the end of first season that it was not satisfactory.

Q.—He goes on to say "we should, however, be very sorry to think that the pace will not be greatly accelerated during the next season of work and thereafter". Did he ever say to you that if you do not get on faster it will take 35 years?
A.—He knew that we were doing all that we could do.

Q.—He gives one reason "waste of time and capital by working only single shift". Were you only working single shift?
A.—Yes, in the first season.

Q.—Who started working by single shift?
A.—Mr. Lewis.

Q.—Was it not essential in order to make proper use of this very valuable dredging plant to work 2 shifts?
A.—I do not remember the reason for this.

Q.—But surely before December 1923 all such questions about getting dredging masters had been solved when it was intended to work dredgers with double shifts.
A.—I was trying to remember the reason. Of course I have no personal knowledge.

Q.—Do you think there can be a satisfactory reason?
A.—I have an idea that it was due to the shortness of pipe line.

Q.—But you had all the pipe line you wanted?
A.—Not at the start of the first season.

Q.—The dredger arrived here 18 months before, did not somebody discover during this time how the dredger was to work?
A.—I think when Mr. Brims came out he first raised the question about the pipe line.

Q.—Did you not work out these preliminary things showing the dredger will work at such and such point and then assume the length of the pipe line?
A.—I think they had various proposals for working the dredgers.

Q.—Were there no definite instructions on the subject here as to what they were to do?
A.—I think instructions were given by Sir George Buchanan.

Q.—But pipes were not sufficient to carry out those instructions?
A.—That was the first season. I cannot tell you definitely because I know nothing about it.

Q.—Surely in ordering the pipe line you would first of all show on paper exactly how it is going to be used and how much will be required?
A.—There was not sufficient information in the first instance.

Q.—Before you are going to do a work of this kind would not you lay down the exact position the dredger is going to keep and the amount of pipes required to do the work?
A.—Yes.

Q.—And would not you provide in anticipation of your dredger starting work for the first season the required quantity?
A.—Yes.

Q.—There was no lack of time?
A.—No.

Q.—As far as I can make out, the dredger was lying here for 18 months and nothing was done about deciding as to how she was going to work, and when she started work in December 1923, she had no pipe line to work with?
A.—I think that is one reason, but I do not know definitely.

Q.—Can Mr. Brims tell us?

A.—Yes, he will be able to tell you. I am not sure about it as I had nothing to do with dredger at that time. I think when Mr. Brims came out he brought up the question of pipe line and he will be able to give you the real reason.

Q.—The " Colaba " did not work in the first season?

A.—No.

Q.—She really started work in December 1924 for the first time?

A.—Yes.

Q.—And the vibration started at once?

A.—Very soon after.

Q.—Here is a letter referring to it in December 1924, that is to say, vibration must have begun as soon as she started work. Can you suggest what that vibration is caused by? It must have been very very severe because Captain Phillips spoke of the funnels working towards each other a distance of 6 inches?

A.—That was when he saw it.

Q.—What do you think it is caused by?

A.—I think it was due to some defect or structural weakness of the vessel.

Q.—Do you think it can possibly be caused by the uneven running of the engines?

A.—That was one of the facts.

Q.—If there was air in the suction pipe the engines would be working but would only be able to get half their quantity of either water or mud and consequently they would be running badly?

A.—I have been thinking it is due to uneven running because it was a more or less steady vibration and in the first instance when it showed up it was at low water and then gradually it became continuous right up to high water.

Q.—But it was first noticeable, as Sir Lawless Hepper said, at high water when it had less to do?

A.—I think it showed up at low water.

Q.—In your letter to Messrs. Meik and Buchanan on the 20th of March 1925 you definitely say that you do not consider that the length of discharge line has in any way affected the output of the dredger. You have showed that when she was dredging at 7,800 feet the output was only 480 yards per hour.

A.—Yes.

Q.—Do you not think it had some effect on the output?

A.—Then on the other hand when she was working at other distances she was getting much larger output.

Q.—The best output is when she is working at 6,970 feet, *i.e.*, 1,488 yards and when she is working at 7,279 feet, the output is 1,125 yards. Therefore this question of 480 yards might be merely an accident. That goes to show that the question of horizontal length has very little importance.

A.—Yes.

Q.—It shows also that you have nothing to complain about the quantity of power?

A.—No.

Q.—We have had evidence from all the engineers and all the Dredging Masters who have unanimously said that the dredgers are working at least better than any other they know of. We have also got it on Sir George Buchanan's authority that the dredging department have done all that is humanly possible. Therefore we have got a perfect tool, everything that a human being can do, and yet are faced with the result that the tool has not produced half its guaranteed output in soft clay?

A.—Yes.

Q.—That points to the fact that neither of these things can achieve the desired results unless you have got the material present in sufficient quantity and is of suitable quality?

A.—Yes.

Q.—On page 2 of Sir George Buchanan's memorandum speaking of 702 lacs estimate he says he protested strongly that it was excessive and would lead to extravagance. Do you know whom he protested to?

A.—I think there might be some reference in the correspondence with Mr. Lewis but I have no idea about it.

Chairman.—Are you not confusing Sir Frederick Hopkinson's question more or less with more material. He referred you to 702 lacs estimate and he says do you know whether Sir George Buchanan protested against this figure?

A.—First of all I think there was some correspondence about it because he did not agree with it because he had not seen the revised estimate which had been submitted to Government before he had seen it.

Q.—Do you know that on the 11th February 1922 he put his own signature to an estimate for 668 lacs?

A.—Yes.

Sir Frederick Hopkinson.—There was not very much difference between 668 and 702. Can you tell me what material he had for making up that estimate of 668 lacs?

A.—He had investigated when out here the probable cost of the works.

Q.—Did he go into your cost?

A.—Not to my knowledge.

Q.—Surely he would have come to you if he wanted information?

A.—He might have gone to Mr. Lewis.

Q.—Do you know if he did it?

A.—I do not know.

Q.—Mr. Kidd's estimate made in 1912 was a total of 325 lacs. Now if you deduct from that 59 lacs as the cost of the roads, etc., as estimated by the Public Works Department, it gives you 266 lacs that is the net cost of the reclamation. Sir George Buchanan's estimate in 1919 was 367 lacs and if you deduct from that 75 lacs as the cost of the roads it gives you a net cost of 292 lacs. The difference between Mr. Kidd's figure and Sir George Buchanan's figure is almost exactly 10 per cent. Do you think that 10 per cent. represents the increased cost between 1912 and 1919?

A.—Decidedly not.

Q.—What do you think would be an approximate increase in cost between these two years?

A.—40 to 50 per cent.

Q.—I suggest to you that it would be 200 to 300 per cent. taking everything. Has not the labour gone up in England from 6 pence to 18 pence, that is 300 per cent. and has not cement gone up from 20 shillings to 80, that is about 400 per cent. Can you give me any idea why Sir George Buchanan imagined 10 per cent. on the 1912 estimate as representing the possible increased cost of the work?

A.—I cannot say.

Q.—Assuming that it was possible to do the work for 266 lacs in 1912, would it be possible to do it for 292 lacs in 1919?

A.—Impossible.

Q.—It looks as if the project estimate, announced in August 1921, is still lower than a comparison of the prices obtaining in 1912 and 1920 would give?

A.—No.

Q.—Do you think that prices nearly doubled themselves from 1914 to 1921?

A.—Yes.

Q.—The prices were gradually ascending from 1914 to 1919 and so 1919 was almost the top of the curve?

A.—Yes.

Q.—Therefore they could not have doubled themselves between 1919 and 1921?

A.—Not in these two years.

Q.—The actual prices being paid in 1919 were those nearly at the top of the curve. So generally speaking 1919 was nearly the top of the curve and therefore 1919 estimate should have been approximately the same as 1921 estimate?

A.—It should have been.

Q.—In Mr. Kidd's Report he suggested, in fact, he stated, that all stone for the reclamation works could be got from the foreshore?

A.—Yes.

Q.—He ends up the statement by saying, " the quarry will enable an important economy to be effected in the cost of the works ". Now Sir George Buchanan, when he came and reported in 1919, dismissed the whole thing in a phrase and said the only thing was a few loose boulders.

A.—Yes.

Q.—Now it occurred to me when I was round the first time there there were great possibilities of opening a quarry there and you could have got most of the stones required for the works.

A.—After taking trials down there to see what the quality of the stone was it might have been possible to do so, but till they take some steps to ascertain whether the rock was sufficient or not I do not think they could have come to any definite conclusion.

Q.—You of course do not know if Sir George Buchanan took any such steps before dismissing the thing?

A.—I do not know, Sir. I have never heard of it

Q.—I would like to go through Sir George Buchanan's memorandum to the press. What is your present estimate for finishing the work, the one in existence when these papers were printed?

A.—That was 702 lakhs.

Q.—You do not think that is sufficient now?

A.—No, Sir.

Q.—Sir George Buchanan says that the figures for the estimated increase from 702 to 1,100 lakhs and the time for completion from 30 to 44 years are purely imaginary. He stated himself in his previous letter that at the rate they were going it may take 35 years. That would take it to about 1960. Further on he says that the Director of Development is the responsible administrative head of the Back Bay Scheme in Bombay. That is not correct, is it? There is no administration of the Back Bay Scheme now. There is only the construction, is not that so?

A.—Well, the reclamation scheme comes in under the Development Department.

Q.—There is no administration of the scheme now. All you need is the construction?

A.—Yes.

Q.—And for that Sir George Buchanan was solely responsible?

A.—Yes.

Q.—Again at page 2 he says in the matter of selecting the area over which dredging operations should take place he had no responsibility whatsoever. Can you tell us who had?

A.—I cannot, Sir. If Sir George Buchanan had not, I do not know who else had.

Q.—No one else could have. He in fact was the man who should have selected the site, and he did select it?

A.—Yes, he did on his own drawings.

Q.—And he bound himself by his plans and estimates and agreement to carry out the work from that particular place?

A.—Yes.

Q.—Again on the next page he says that this restriction of area of 15½ million yards was particularly suitable material. Do you know what he means by it? Was it more suitable than any other material?

A.—I believe that according to his calculations there was a larger proportion of clay in comparison with the total quantity of material.

Q.—But that is the only reason?

A.—Yes.

Q.—And as a consequence of that the difficulty was overcome by arranging to obtain a certain amount of material from Back Bay itself. Mr. Kidd in his report had given attention to getting material from Back Bay and if suitable material could be obtained there it had great advantages over any other possible source because it was nearer?

A.—That is so.

Q.—But he goes on to say, " This was quickly disposed of as the conditions are a very irregular rock bottom containing pockets or thin layers of loose sand in insufficient quantity within practical distance, and—for a great part of the year—a heavy ground swell prevails which renders the working of dredgers dangerous, and frequently wholly impossible ". Would you agree with that statement?

A.—Yes, if you take the whole area into consideration.

Q.—" Containing pockets or thin layers of loose sand "?

A.—There is other material besides sand.

Q.—It is contained in pockets?

A.—More or less in pockets. Some pockets are large.

Q.—" In insufficient quantity within practical distance ". He speaks of the whole scheme of 25 million yards?

A.—Yes, for the whole scheme it would be impracticable.

Q.—After what we have heard this morning, *viz.*, that the mud when stirred up with the pump becomes what is practically only dirty water, there is nothing whatever to prevent that going through the bottom of the reclamation bank?

A.—Not unless it is sealed as designed.

Q.—You soon saw you were losing material through the mound?

A.—Yes.

Q.—Did you actually see the material going through?

A.—Yes.

Q.—And of course you suggested that should be stopped and retained?

A.—Yes.

Q.—Sir George Buchanan objected to this?
A.—Yes.

Q.—He refused to have it done at that time?
A.—Yes.

Q.—And you and the Director of Development did it in spite of his objections?
A.—That is so.

Q.—Again at page 3 he says, " I assert most positively that there is nothing the matter with the dredger ".
A.—I think that is true, Sir. So far as the dredger is concerned, as a machine.

Q.—Do you not think the " Colaba " is a luxury? Would it not have been better to have put a land station on the nearest point and pumped direct from the " Lloyd " to that station?
A.—I do not think there would have been material enough within reach. The land station would have had to be a fixture.

Q.—Could you not select more than one site, for as long as you did not go more than 5,000 or 7,000 feet away you can take all the material within that radius. Then if it became necessary afterwards you can take advantage of a monsoon and move on the land station to another point?
A.—It is pretty heavy work to move it during one monsoon.

Q.—After all it is moving only of an engine?
A.—You have got to make the foundations. The foundation would be a pretty big item.

Q.—You could get the foundation beforehand and the moving could be done in a monsoon?
A.—Actual moving could be done in a monsoon.

Q.—The " Colaba " cost altogether about 1/4 million?
A.—I think it was more than that.

Q.—A land station could probably be done for £50,000 or £60,000 or less?
A.—I could not say personally what the land station would cost.

Q.—There would be a considerable saving in putting up a land station?
A.—Yes, for one single station there would be.—

Q.—I noticed in their estimates they speak as if they had thought of this because in the estimate of 1919 they do speak of a land station, don't they. They call it the shore pumping station. Does that mean a floating craft?
A.—I think he meant a floating craft.

Q.—You have seen Sir George Buchanan out here since you have been Chief Engineer. Have you?
A.—Yes, when he was out in the end of 1924.

Q.—Did he make any suggestions to you about altering the system of working the dredger in order to increase the output?
A.—No, Sir.

Q.—He further complains that " the Executive had neglected to blind the retaining wall and as fast as the material was pumped in it flowed out again through the interstices in the wall and was then returned into the upper portion of Back Bay on the flood tide, thus largely accounting for the wonderful natural siltation, in paragraph 19 of the sub-committee's report ". Was there any " wonderful natural siltation "?
A.—Not I am aware of.

Q.—The material that comes in is sand?
A.—Yes.

Q.—Do you know what he means by this " wonderful natural siltation "? Do you know of any wonderful natural siltation?
A.—No, Sir.

Q.—As far as your levels show it is not there?
A.—No, Sir.

Q.—As I said before, he said, you, the executive, had neglected to blind the retaining wall. The facts are you wished to do it and he prohibited you from doing it.
A.—That is so, Sir.

Q.—He also goes on to say that " the Committee's figures are for one dredger working in the harbour, and takes no account of the large dredger which should now be working in Back Bay, and for the improvements in the general working of the dredgers, which we had said we were confident would be attained ". Did he make any improvements in the working of the dredger?
A.—None at all.

Q.—He also accuses you (at page 4) of a lack of efficiency and economy. Has he ever complained to you personally about the lack of efficiency and economy?
A.—Never.

Q.—Has he ever written to you about that?
A.—No, Sir.

Q.—Not at any time?
A.—No, Sir.

Q.—On the 17th March 1922, Mr. Lewis wrote to Meik & Buchanan giving reasons why he wanted certain plant?
A.—Yes.

Q.—On the 11th April 1922, Meik & Buchanan wrote criticising this and suggesting that some of the things were not required?
A.—Yes.

Q.—On the 18th May 1922 he wrote another letter on the same terms saying that " We are still unconvinced that you require three of these machines at once, estimated to cost over £12,000, nor do we understand why you want 20 ton lifting power when the very heaviest of the protection blocks shewn on our last drawing No. 3259, is only 15 tons ". It was for Sir George Buchanan to say, " I do not think these are necessary and therefore I shall not supply them "?
A.—He could have done so.

Q.—If he had been in close touch with the work, surely he could say that without putting the responsibility on somebody here?
A.—I think so.

Q.—I saw in one letter he spoke of 3 to 7 ton being enough for all requirements?
A.—Yes.

Q.—But he says his drawings call for 15 ton stones. Are there any 15 ton stones in the reclamation bank?
A.—No, Sir.

Q.—What is the biggest?
A.—About 7 tons.

Q.—And there are a very few of those?
A.—Yes.

Q.—He further says, " For years I have been struggling against extravagance and inefficiency in this undertaking. I pointed out in February 1922 and further emphasised in April 1922, that no cost accounts were kept and that it was impossible to exercise economy without a proper system of cost accounting ". Were no costs kept?
A.—I think that each Deputy Chief Engineer kept his own costs in his own way at that time. He had the costs worked on the Public Works Department system by the Audit Office.

Q.—Did your Deputy Chief Engineer keep his costs?
A.—I kept mine for my own section.

Q.—Did you keep your own costs at the Marine Lines?
A.—As far as I could I did.

Q.—You knew every month what it cost?
A.—Yes.

Q.—Did Sir George Buchanan have a copy of the costs?
A.—Once or twice he asked me for figures and I showed them.

Q.—But did he not ask them to have sent monthly?
A.—Not then.

Q.—How could he tell that the work was being done properly without those costs?
A.—He could not have.

Q.—Did Sir George Buchanan ever tell you that he asked for tenders to be sent in for completing the reclamation wall or a portion of it?
A.—He never told me, Sir.

Q.—Do you know if it was done?
A.—I believe they invited tenders for a length down at Colaba, 8,000 feet. I believe that 8,000 feet was for mass concrete wall.

Q.—What is the rest?
A.—Rubble and mass concrete.

Q.—Supposing that it had been built of large concrete blocks, would it have cost more or less than the mass concrete?
A.—That would have cost more, much more.

Q.—You would have had to keep heavy cranes?
A.—Yes, of course.

Q.—You think it would have been more expensive?
A.—Yes.

Q.—The plan showed that wall was to be built of large concrete blocks faced with stone, a much more expensive method than has been adopted?
A.—Yes.

Q.—A suggestion was made yesterday it was a possible way of completing the work would be to finish the reclamation wall, back it up with moorum, make a marine drive right round the whole of the reclamation and have inside a boating lake with shrubs all round and make it more or less the sort of thing you have in England in seaside places. Would there be any difficulty in doing that?
A.—No, I do not think there would be.

Q.—You could not leave the blocks 3, 4 and 5 as they are to-day. Something would have to be done to make it less of an eye-sore, to make it ornamental?
A.—Yes.

Q.—It is a quite feasible scheme?
A.—It is.

Q.—Would it not be a very expensive one?
A.—No.

Q.—Would it have this advantage that at any time when funds permitted or if so desired, reclamation could go on slowly from the shore with moorum filling and making up the full height as you went on?
A.—You will have to do it block by block, Sir, on account of the storm-water drains.

Q.—You take your storm-water drains in advance.
A.—Then you will have to shut your water out, because with inlets for letting the water in there has always to be a certain depth. Then it means a lot of difficulty in putting in your storm water drains.

Q.—Did you at all times before Sir George Buchanan severed his connection with the works look upon him as your chief?
A.—Yes.

Q.—He was the man you would apply to when in doubt or difficulty?
A.—That is so.

Q.—You would expect to receive all your drawings from him?
A.—In the ordinary course one would. But in this case we did not. We made our drawings and submitted them for his approval.

Q.—And the work was not done until he had approved of the drawings?
A.—Generally speaking.

Sir M. Visvesvaraya.—Did Sir George ever suggest to you or give you any idea that he was not the responsible Engineer?
A.—No, Sir.

Q.—Did he ever suggest that you should work 3 shifts on the dredger?
A.—No, Sir.

Q.—Did he in the first season complain about your working only in one shift?
A.—I could not tell you that, Sir. I do not know.

Q.—There is a carriage road along the whole length of the reclamation on this side, is not there? Along the sea-side close to the edge of the sea.
A.—Yes.

Q.—It would cost very little to make it serviceable as a drive?
A.—I do not quite understand.

Q.—There is such a carriage road, but it has been derelict?
A.—No, Sir, I mean the Queen's Road.

Q.—Has there not always been a drive right along?
A.—I do not think there was a drive. There has been a ride. There has been a pathway and a ride.

Q.—Would it cost much to make a road for a drive along this side of the reclamation, *i.e.*, along the old sea shore?
A.—No, I do not think it would be expensive.

Q.—Would not a ride be a very desirable thing for Bombay?
A.—I think it would.

Q.—Is it not greatly called for?

A.—Yes, judging by the complaints we had when we had to close a portion of the existing one.

Q.—You remember you promised to collect some information for me on the day on which Sir Lawless Hepper was examined? May I know to what extent it has been collected?

A.—I have already sent some of them to the Secretary of the Committee. The others, which are statements, are being prepared.

Q.—I suppose the details of expenditure and cost of the dredgers have been collected under the directions of Sir Frederick Hopkinson?

A.—That is being done. That for the dredging plant has been completed now.

Q.—When will that be ready?

A.—It was nearly ready this morning.

Q.—All these will be signed by you I hope?

A.—I can sign them, they have been sent in through the Director.

Q.—I have to traverse some of the ground already gone over by Sir Frederick Hopkinson. The information you have ready at hand you may kindly give now and the others you can give me in a day or two. Recently in His Excellency the Governor's speech also it was mentioned that the prospects of the scheme had improved since the Advisory Committee made its report and you know that Sir Lawless Hepper also said the same thing, namely that the prospects had improved since the Advisory Committee made its second report. Can you tell me in what respects the prospects of the scheme have improved?

A.—In the output of the dredger.

Q.—I want exact figures. Last year you dredged about 1,800,000 cubic yards roughly. Is it not so?

A. 1,828,303 from the harbour and something from the Back Bay, *viz.*, 372,925 cubic yards.

Q.—That means about 2,201,000 cubic yards?

A.—Yes.

Q.—From your experience of the last season by how much do you hope to increase the output in the coming season?

A.—I am allowing for the same output from the harbour, although I hope we shall be able to do better, for the reason that, although the last season was the best season we have had, it was not strictly a normal season in that the Sir George Lloyd was delayed for 17 days on account of the Colaba being out of commission. For the normal season, after allowing say 7 days of that for bad weather, that comes to 10 days extra working. But I am still adhering to the output of 18 lakhs as a normal output from the harbour.

Q.—What will be normal output in your opinion from the Back Bay?

A.—I estimate that we would probably get 760,000 yards.

Q.—So the two together will be .....

A.—$2\frac{1}{2}$ million yards.

Q.—Now if you increase the number of pumping hours by employing three shifts what do you expect?

A.—You get $2\frac{1}{2}$ million yards from the harbour providing that we get the same output in each shift. But I think it will be found that the night shifts do not get as much.

Q.—But if you have a separate shift and put your best men on at night .....

A.—You will get 50 per cent. greater output and that will mean $2\frac{1}{2}$ million yards from the harbour.

Q.—About the Kalu what increase in output do you expect in the next season by improved working and what by increasing the shifts to three?

A.—I have allowed an output of 760,000 on the double shift as worked at present, that is, working 18 hours.

Q.—You can get a million and 60 thousand cubic yards by having three shifts?

A.—Yes, that is a very optimistic view.

Q.—Will you put the total output at $3\frac{1}{2}$ millions only?

A.—Yes.

Q.—That you think will be an optimistic estimate?

A.—I think so.

Q.—What would be the estimate of which you can be quite sure?

A.—I should say about 3 million on the three shifts.

Q.—So the output may vary from 3 to $3\frac{1}{2}$ million cubic yards for the coming year?

A.—Yes, that is on the three shifts.

Q.—There has been much blame thrown on Sir George Buchanan for an estimate of 367 lakhs. If he had made an estimate for 702 lakhs, would it not have been ridiculous on his part, if you can fill the Back Bay with moorum or earth without resorting to any scientific method at all? If you can calculate it now, you would find that for four crores or five you could easily fill it with earth. That being so, an estimate of 702 lakhs would be absurd on the face of it. The total quantity of filling is 28 million cubic yards?

A.—Yes.

Q.—Now you can get moorum filling at Rs. 1-8-0 per cubic yard?

A.—Yes.

Q.—If you arrange to get it in a very large quantity, you might be able to do it for much less, say at Rs. 1-4-0?

A.—Yes.

Q.—Assuming that it is Rs. 1-4-0 for 28 million cubic yards it will come to—?

A.—That is for consolidated material.

Q.—You will have to add another 10 per cent.?

A.—Yes and you will have to allow percentage for shrinkage.

Q.—If you brought moorum from outside, how much shrinkage will be necessary?

A.—I am reckoning 15 per cent. on the estimate. That is in excess of the quantity required for actual consolidated filling.

Q.—If you work out the figures at Rs. 1-4-0 for 28 million cubic yards it will be 350 lakhs. You may add 80 lakhs for the sea wall?

A.—Yes.

Q.—That will bring you to 430 lakhs?

A.—Yes.

Q.—In any case the cost of the filling would not be more than 5 crores. Do you admit that?

A.—Yes.

Q.—If that was so, surely Sir George Buchanan would not have submitted an estimate for 702 lakhs?

A.—But then you have to take into account the length of time required.

Q.—Probably you can do it sooner by moorum filling than by dredging? Here it only means running more trains?

A.—There is a limit to the number of trains that you can run.

Q.—You may get 8 trains a day. That would be 8,000 cubic yards a day. You may also get it from the Great Indian Peninsula Railway *via* Dadar. The other day we discussed about the possibility of getting 12,000 cubic yards a day. It is also possible to get material from Kalyan side and that will complete the work in about three years' time?

A.—I do not say that it is impossible.

Q.—At any rate an estimate of 702 lakhs looked excessive and ridiculous as a reclamation proposition if Government had not committed themselves to the purchase of dredgers?

A.—Yes, if done on a very large scale like that and if it could be arranged to get the material in. But I think you will find very considerable difficulty in getting the number of trains required. All will have to come in on one line, and it is only this year that they have quadrupled their line. Up to this year it would have been impossible to run any trains except at night.

Q.—But in future it might be possible?

A.—Yes.

Q.—When a new work is started it is usual to prepare approximate estimates; and then as soon as possible after the work is started to improve upon them by preparing detailed estimates and collecting further information?

A.—You are speaking of the Public Works Department system?

Q.—When an estimate is prepared usually the person who prepares it is less experienced than the people who are actually in charge after the work is started. As the work proceeds they gain in experience and wisdom and probably there would be a more reliable estimate?

A.—I think it is a general rule, if engineers are called in to give their estimates, that they give a sufficiently close estimate to what the work will actually cost; when they know from their experience what the contractors' prices would be they can put in a close price.

I do not think that an engineer of any standing would agree to alter an estimate after he has put up an estimate for the work. If he found that the contractors' prices were too high, he would find out where the reason was

Q.—This is not a case like that, because it is a very large area you are filling. There are uncertainties about shrinkage and uncertainties about the cost of material, because it depends upon the volume of the material and the arrangements made for transport, etc.?

A.—Yes.

Q.—Do you think that any engineer will be able to give a very reliable estimate at the very beginning? Would anybody waste money on scientific appliances if he could do it in the ordinary way, in the ordinary methods practised in the country?

A.—It depends upon what the appliances were. We might easily import labour saving appliances such as concrete mixers.

Q.—I am speaking of the reclamation by earth filling. You can do the filling with earth or murum. There is nothing scientific about it?

A.—If you have got sufficient depth of material, you may be fully sure that a good steam navvy would be able to beat labour prices.

Q.—My point is that no engineer would have submitted an estimate larger than 5 crores for such a work. Would you agree?

A.—If he were basing it on the moorum filling.

Q.—Since he knows that he could do it by moorum filling, why should he bring in scientific appliances? By moorum filling you could do the work for 5 crores. If that is so, no body would suggest that a dredger should be purchased and the work carried out at an expenditure of 7 crores?

A.—No, not in that case.

Q.—Because they did not know that the cost would go up to 7 crores, they launched on that scheme?

A.—I am sorry I do not quite understand the question.

Q.—If they had gone into the details and found that it would have cost 7 crores, they would have abandoned the project for dredgers originally?

A.—Yes, if they had originally gone into the details and found that it was going to cost 7 crores by dredger filling and only 5 crores by earth filling.

Q.—The contract for the dredgers shows that the manufacturers have no responsibility for giving the required output. Is it not so?

A.—Yes.

Q.—They have no responsibility for ensuring that the dredger would give the required output at the site?

A.—All that they had to do was that the dredger was to pass a test on the Clyde.

Q.—Was that test according to the normal conditions under which the plant would work? I mean was there a pipe line?

A.—No.

Q.—Then the original specifications were defective?

A.—Yes.

Q.—I think that there ought to have been a clause that the full amount should not be paid to the contractors until they had satisfied the engineers out here that she could get the output at the actual site. But there was no such clause in the contract?

A.—No.

Q.—To that extent was the contract defective?

A.—Yes.

Q.—Who is responsible for that omission?

A.—That would lie between Sir George Buchanan and Sir John Biles, who was the Naval Architect who was nominally the designer of the vessel. I do not know whether it is actually Sir George Buchanan who is responsible as being the engineer to the scheme.

Q.—Was it not necessary for somebody on behalf of Government to see to that?

A.—Sir John Biles was acting on behalf of the Government of India. He was appointed by the Government of India to supervise the construction of the dredger and to see that the test was carried out satisfactorily and it was he who gave the certificate.

Q.—Was it not desirable that somebody on behalf of the Local Government should be watching the development of the contract?

A.—In ordinary circumstances I do not think that it would have been necessary.

Q.—You think that it was quite sufficient to have a man of Sir John Biles' experience if he is acting on behalf of the Government of India?

A.—It seems rather useless to send home anybody else as a second man.

Q.—This is not an ordinary contract. It is a matter of about $1\frac{1}{4}$ crores. Do you think it is right to leave it to one gentleman to deal with such a large contract in this manner?

A.—If I were in the position of Sir John Biles, I should not like somebody to be sent out. But if I were a representative of the Government of India and the Government of Bombay proposed to send somebody else, I would resign if I was not competent to do these tests by myself and let other men to do it. That is my opinion personally.

Q.—Is there not wisdom in a multitude of counsellors?

A.—I do not think there is, in a case like this.

Q.—Another point is how was it that tenders had not been invited from other manufacturers. I understand that some of them would have given a guarantee to work the plant here so as to give the required output?

A.—That is difficult to say. It should have been put in the contract. They all practically get the same specifications and probably this was not mentioned in the specification. Ordinarily, the contractors who build the dredgers run the boat for six months; that is a very usual thing, and when they send it out the chief engineer is provided by them; they run the boat for six months and they are responsible for any defect if it shows up within that period. That is a very ordinary fact.

Q.—That is not departed from in this case?

A.—I do not think it is.

Q.—With the permission of the Chairman I would ask for the specification of the 'Kalu' if available.

(The Chairman asked the Secretary to note this and get the specification of the 'Kalu' when it was originally purchased by the Port Trust.)

A.—I believe there was some clause in the contract: I had not had time to go through it.

The Chairman.—Anyhow, Sir M. Visvesvaraya's point is that there was no provision for her doing any work in India and the question arises whether Simons & Co. the makers will tell us what their view of it was.

Sir M. Visvesvaraya.—Now, when you found that the dredgers had not come up to expectation, when the "Colaba" was shaky and "Sir George Lloyd" did not give the required output, was it not desirable to consult other experts, both in England and America, or to ask the makers themselves to send out a man to go over the calculations again and put the dredgers aright? Your case is that the material is bad.

A.—There is nothing wrong with the dredger as a machine. If she is put into the material that is suitable she will give the output required.

Q.—Was it not the duty of the manufacturers, in such a large contract as this, to make sure of the material in which it was to work?

A.—That is not the contractors' business. I should say that any of the contractors who are tendering would merely pass it on the specification.

Q.—In this case, suppose they had been obliged to give the plant in working order on the spot, probably they would have considered that question also?

A.—That is likely if they were responsible for the output at the site.

Q.—When you found that Sir George Buchanan would not do anything and the manufacturers were not moving in the matter, would it not have been well for the local Government or for yourself to take steps to have the plant inspected by outsiders? Is there any professional etiquette against such a procedure? Is it not the right procedure to take? If it is a small machine you can get the local people to examine it, but in the case of a big plant like this, would it not have been well to get experts from other parts of the world, if necessary, and see if it can be put right?

A.—I think the Government of Bombay did consider the question of whether they could get an expert out from home; because they asked me whether I could mention the names of any eminent engineers who can give advice on the spot. I mentioned Mr. Wentworth Shields of Southampton and Lyster, the Chief Engineer of Liverpool Docks.

Q.—Did they take any action on it?

A.—I don't think they did; but they asked the question; they believed it was costly to invite somebody from home.

Q.—Did you make any separate payments for the drawing supplied by the firm of engineers, or is all that work covered by the 2 per cent.?

A.—The whole of their work is covered by the 2 per cent.

Q.—I want information about the future cost of the work in a nutshell if you can give me. I want specific data. You can give it to-day or you make a note of it and give it to-morrow?

A.—Yes.

Q.—You know the average depth of filling required varies from 5 to 5½ yards in the whole area?

A.—Yes. They vary in different blocks, from 10·5 feet in block 8, to 20·16 feet in block 4.

Q.—In blocks 1 and 8, the average is 8·7 yards roughly?

A.—That would be.

Q.—And in blocks 2 and 7 it would be about 5 yards and in the rest 5·7 yards.

A.—In 2 and 7, it would be under 5 yards.

Q.—In 2, it is 6·3 and in 7 it is 4·4. So, the average is 5·8.

A.—4·75 yards; that is the average of 2 and 7, that is approximately.

Q.—Then, in 3, 4 and 5, the average depth is 5·7 yards.

A.—You are taking them on the depths of each quantity.

Q.—The total quantity divided by the area.

A.—That is probably correct.

Q.—The average for the whole filling is 5·5 yards?

A.—Yes.

Q.—What is the average at which you expect to do the dredging in future with the improvements you are contemplating? Supposing you got $2\frac{1}{2}$ million cubic yards last season, at what rate wolud you be able to do it next year, with three shifts, after all these improvements are effected? You can say this from your experience in the past?

The Chairman.—You would fill in by March 1928 blocks 1, 8 and 7? Are you satisfied that it would be done by March 1928?

A.—Yes.

Sir M. Visvesvaraya.—What would be the rate of dredging? You said that last year, you did it for 12 as, from the harbour and from Back Bay at Re. 1·3 per cubic yard. I want to know the average rate at which you will be able to do it?

A.—0·64 Re. is the price that I have worked per cubic yard from the harbour.

Q.—What have you to add to that in order to include the overhead charges?

A.—That includes all the dredging staff, excepting the establishment charge, *i.e.*, the engineers, and the personnel on the dredgers.

Q.—What percentage would you add to that, including all the overhead charges, the secretariat and everything?

A.—You have to add about 12 per cent.

Q.—Is that all?

A.—That is what I think it will amount to.

Q.—That means ·08.

The Chairman.—In terms of annas it will be $11\frac{3}{4}$ annas per cubic yard.

Sir M. Visvesvaraya.—That seems to be the rate per cubic yard. Next year, if you do the work by dredging you will be able to do it at 12 as. per cubic yard, all charges included, the Secretariat, the Development Directorate and the Accounts Department?

A.—Yes; that would cover all.

Q.—For 5 cubic yards at 12 annas per square yard of land reclaimed, the cost will come to Rs. 3-12-0.

A.—Yes.

Q.—If you spend Rs. 3-12-0 per square yard you will be able to reclaim 1 square yard which may be worth anything between Rs. 20 and 100?

A.—That is taking it for the whole area.

Q.—5·5 cubic yards is a very good average for the whole area?

A.—Yes.

Q.—Now 5·5 × ·75 as. will give Rs. 4-12-0.

A.—Yes.

Q.—I want to fix up these facts. For one square yard reclaimed you would have to spend Rs. 4-12-0.

A.—That is for dredged filling.

Q.—And for moorum filling can you give me an estimate? The other day you said it would be 1·56.

A.—1·57 is my figure.

Q.—Could you not reduce it if you work in a mass; if you carry on operations on a large scale won't the cost be reduced?

A.—Yes; it would be reduced.

Sir Frederick Hopkinson.—You cannot take that as correct. If you carry on on a large scale you will require a large plant?

A.—Overhead charges would be reduced.

Sir M. Visvesvaraya.—You know something of the country beyond Bandra on both the G. I. P. and the B. B. & C. I. Railways.

A.—Yes.

Q.—You went to Kandivli for the sake of the stone, not moorum?

A.—For stone, not moorum.

Q.—If you want moorum or other stuff you would try to find out quarries nearer?
A.—Yes.

Q.—And there is a possibility, if investigations are conducted, of reducing the rate?
A.—Yes.

Q.—So, from 1·57 how much would you bring it down to assuming that you have to do moorum filling on a large scale?
A.—It is a very difficult question to answer.

Q.—We have to come to a decision. You know on this side of Kandivli there are mounds of earth and undulating ground?
A.—Yes.

Q.—You can possibly get moorum cheaper?
A.—I have examined some of those areas; in some of them there is very little moorum, but a lot of rock; I don't think it would be cheap.

Q.—Can you get clay and soil nearer this side of Anderi?
A.—In that neighbourhood and in the interior there is a large area.

Q.—There is no moorum?
A.—Between Anderi and Kandivli there is plenty of moorum.

Q.—So from 1·57 by how much would you reduce the cost?
A.—I won't like to reduce that figure at all. I would rather keep it. It would be a question of having to put in expensive railways and there would be extra plant. The only reduction would be in the case of overhead charges like the establishment. It would be very slight.

Q.—If you are running more trains, and there is a better organisation, won't you bring down the cost?
A.—We may get a reduction in freight.

Q.—Also the contractors may load the cars at cheaper rates.
A.—I do not think they will get a lower rate than what we get at the present time.

Q.—Probably the distance may also be reduced?
A.—It may be reduced by a mile or two, but I don't think it will have much influence on the total cost.

Q.—1·57 × 5·5 would give Rs. 8·63?
A.—Yes.

Q.—So it will cost 8·63 per square yard by moorum filling and Rs. 4·12 by dredging?
A.—Yes.

Q.—That is, assuming your own rates?
A.—Yes.

Q.—In either case, there is the certainty of the filling being done for less than Rs. 9 per square yard reclaimed?
A.—Yes.

Q.—That is one point I want to see placed on record.
A.—That is for filling material alone.

Q.—Of course the sea wall is different.
I am going out of your sphere of engineering, but you know the value of land may be anywhere between Rs. 20 and 100 per square yard in that area?
A.—If you can get at Rs. 9 a square yard you could certainly fill it in with that. But you have to add something more. That rate is for filling only, that is not for completing the area ready for sale.

Q.—You will have to add for railways and roads, about another crore of rupees?
A.—The expenses on road making, sewerage and lights, are pretty heavy.

Q.—At the outset, could not the heavy expenditure be reduced?
A.—There is another point too. Taking the whole area you are taking into consideration all the roads and recreation grounds and open spaces. So that average is not for completing the area.

Q.—Half the amount will be required for open spaces, it is said.
A.—Yes.

Q.—The remaining half might be all sold?
A.—If you take it in as the value of building land you have to double the price right-away from Rs. 9 to 18.

Q.—For open spaces, either the Government or the municipality might pay?
A.—Somebody will have to pay.

Q.—Because open spaces are for children and for public purposes?
A.—We ought to have a value put on that too.

Q.—They cannot be handed over for nothing?
A.—We ought not to do it. Some price ought to be given for it.

Q.—So this point you accept as a certainty now. By moorum filling you can reclaim 1 square yard for less than Rs. 9.
A.—That is the average for the whole area.

Q.—It would not be very much more, because the variation is between 5 and 5½ yards?
A.—I am referring to the area—Rs. 9 a square yard for the whole of the reclaimed area including roads, etc., and open spaces; all will be Rs. 9 a square yard for filling only.

Q.—I only take the filling. Laying out of the roads may be a separate item. For reclaiming and giving you plain level land by dredging, if the dredgers work well and if they work fast enough, you can do it for Rs. 4·12.
A.—Yes.

Q.—I understood the other day from Sir Lawless Hepper that they had calculations for bringing material by barges across the harbour. Have you got the calculations?
A.—I have not.

Q.—You have got an estimate for 927 lakhs now for the whole work?
A.—Yes.

Q.—According to Sir Lawless Hepper's report?
A.—Yes.

Q.—Out of those 927 lakhs roughly 80 lakhs is for the sea wall. It is for the Kandivli quarry, permanent way, and rolling stock?
A.—That is correct.

Q.—927·35 lakhs is the cost given. Is that authorised by anybody.
A.—No, that is not the sanctioned estimate.

Q.—You have got detailed estimate for these now?
A.—No, not in any great detail.

Q.—Is that the figure you cling to now as reliable for the purposes of completing the work? Do you consider that it is more correct?
A.—I think that it is more correct than the original estimate.

Q.—If you revised the estimates now, would you put it at a lower figure than that in view of the recent improvements in the working?
A.—It will be fairly near the mark. I have got an estimate that is being checked at the present moment and it is roughly 10 crores. That is after allowing 5 per cent. for contingencies.

Q.—You have got here unforeseen charges 10 lakhs already? That is very small?
A.—Yes.

Q.—When will you give us a reliable estimate?
A.—It is being checked. It has got to be drawn up in form. It will take about 2 to 3 days to type.

Q.—Could you give us a comparative statement showing the original estimate and the actual expenditure against each of the heads and the balance available up-to-date? What we want is the actual position now, assuming that your estimate is the final one.
A.—It will take some time to make a comparative statement as it has to be typed. We are short of men.

Q.—Could you not put on men specially for that?
A.—A lot of time is taken in checking those figures.

Q.—It is most important for us to know what the expenditure has been up-to-date.
A.—Yes, I can give you that.

Q.—I want another comparative statement showing the 702 lakhs project estimate and the expenditure against each of the main heads with any explanations for the excesses on individual heads. We want a comparative progress report both as regards the 702 lakhs estimate and the 967 lakhs estimate. I am rather concerned; in spite of improvement in the working of the dredgers you still say that the cost will go up to 927 lakhs. The other day the 927 lakhs was accepted by Government?
A.—That was got out in February.

Q.—Some time has elapsed since then?
A.—That is, 9th of February.

Q.—Conditions have improved.
A.—Yes, we have got further information since then.

Q.—What do you say to this, is it possible to give us these 2 statements?
A.—What I can do is to put them all on the same sheet.

Q.—We have the total expenditure up to 31st July 1926. It was given by the Deputy Accountant-General. He said the total cost of the work was 474·51 lakhs. Including interest it was nearly 6 crores. We want the same expenditure distributed over the main heads?
A.—You want it for the 702 lakhs, 926 lakhs and for the fresh estimate.

Q.—Have you given us the designs and specifications of the dredger?
A.—I brought them here the other day.

Q.—Other than those by Sir George Buchanan? I should like to study them. You have got references in the printed book to the contract with Messrs. Meik and Buchanan. Is there any copy of the original contract?
A.—I have not any.

Q.—There is also a report on the tests carried out on the Clyde. There is nothing more than that?
A.—No. You will get all the information available from the printed book.

Q.—Do you think that Sir Alexander Gibb's statement that moorum could be got at Rs. 3 per brass is an underestimate?
A.—I consider it is.

Q.—Where did he get this information from?
A.—I could not tell where he got the information from as to the price of Rs. 3.

Q.—Mr. Arbuthnot was here, but he was not able to give us any figure yesterday.
A.—I don't know where he got it from.

Chairman.—He does not indicate any locality any more than you can?
A.—No.

Sir M. Visvesvaraya.—Have you worked out the cost of lorries?
A.—We have got this.

Q.—Do you remember the figure? There is a hillock beyond the Malabar Hill, Kambala, near Worli. Could not you get some filling from there?
A.—Lorry filling is only a very small item.

Q.—What was the object of your recent tenders?
A.—The Government wished to ascertain whether they could get a better price for dry filling from contractors than we can do it at the present moment and they therefore proposed to let a contract if they could get a favourable price.

Q.—Have you got any offers?
A.—We have not got any. The tenders have not been sent in and will not be sent in until October.

Q.—Do you expect any?
A.—We have got 12 enquiries locally.

Q.—But the specifications seem to be very rigid?
A.—I am not responsible for it.

Q.—Not you?
A.—I did draft the specification but it was submitted to Sir Alexander Gibb and he said mine was too rigid. He put in another draft of his own which is worse than mine.

Q.—You said the other day that there was no specification for the sea wall.
A.—No.

Q.—On whose specification is the wall built now?
A.—I made up my own specification. I was given a cross section of the wall and was provided with material, whatever material could be spared.

Q.—Did Mr. Lewis have his own specifications?
A.—No.

Q.—He worked without any specification?
A.—The only specification was a verbal one that they were to use the small stone in the hearting and they reserved the large stone for the protection of the wall.

Q.—Is not that an important thing in constructing a work of this magnitude? I am putting this question from a public point of view.
A.—There ought to have been a proper specification written by the Engineers—by Sir George Buchanan.

Q.—If Sir George Buchanan did not give the specification, why did not the Engineers on the spot do it?
A.—One reason is that at the commencement of the work Mr. Lewis was very busy and he gave us a free hand more or less in the working.

Q.—Would not the loss be very considerable if you work in this way without any previous calculations?

A.—The important part of the work consisted first of all of the construction of the sea wall and Mr. Lewis already got out a plan to begin and I worked there. When he gave me the work of construction of the sea wall, I had the cross sections and we were limited to the quantity of stone.

Q.—I do not understand the designs for drains, cross walls. Could you explain very briefly? Do you have the cross wall in combination with the cross drains?

A.—You mean the bunds?

Q.—You first have the drains?

A.—Storm-water drains are constructed first.

Q.—And then?

A.—The bund will be tipped along the top of the drain. One drain has been completed in No. 8 area. You see the main holes of the No. 1 drain in the surface of the moorum filling.

Q.—Cross bunds are made of moorum?

A.—Yes.

Q.—On what are the cross drains founded?

A.—They are founded upon rock for a portion of the length, and the rest when we get to soft material we dredge out, fill in with rubble and put on a concrete foundation and the drain is built upon it.

Q.—You say for your material you depend on Mr. Kidd's borings and levels taken in 1912 or thereabouts?

A.—Yes.

Q.—Might not the sea-bed of the Harbour have altered during the last 14 years. Is it not necessary to make sure about that?

A.—I do not think there have been very many alterations. We have the Admiralty chart which should note variations.

Q.—You have satisfied yourself on that point?

A.—Yes, we found that Kidd's borings were reasonably accurate.

Q.—What is the total quantity you got by motor lorries.

A.—I think it is about 3,500 brass a month.

Q.—In preparing that estimate for 927 lakhs what amount do you expect to realise from the sale of the plant at the conclusion of the work,—from dredgers and accessories and permanent way and rolling-stock respectively?

A.—It does not appear in that statement (witness referred to the printed copy handed on to Sir Frederick Hopkinson).

Q.—You have got some idea about the figures yourself?

A.—I think I gave a figure to the Advisory Committee. I cannot remember exactly. It might have been about 40 lakhs.

Q.—That has got to be deducted from this 927 lakhs?

A.—Yes, but that is a very doubtful item. You must get a purchaser for the dredger.

Q.—That will reduce your estimate?

A.—Yes.

Q.—What will be the quantity of filling remaining to be done after blocks 1 and 8 are completed? I can give the figure. It is 22 million cubic yards. If you want to complete that in 6 years you should do 3·7 million cubic yards per annum if the dredgers worked satisfactorily in the future. As you expect to do $3\frac{1}{2}$ million cubic yards the whole of the project could be completed in about 6 years.

A.—I think I have said 3 million for the 2 dredgers.

Q.—If you took into consideration 3 shifts. You have taken into consideration the improvement effected last year, what would be the cumulative effect?

A.—7 to 8 years.

Q.—Assuming that you are going on with moorum filling as you are doing now, will you be able to complete it in 6 years?

A.—I cannot foresee now as you will have to allow for covering up the dredging. You have got to allow for 18 months after the last block was deposited with dredging, so that you may take it that it would take about 7 to 8 years.

Q.—Supposing you combine moorum filling and dredged filling, what will be the maximum output per annum? Now assuming that you have got moorum what is the maximum you expect daily by rail?

A.—That depends entirely on the number of trains that will have to be taken. We might be able to increase it from 2 trains running at present to 8 trains a day.

Q.—Assuming you can get material in sufficient quantity to run those eight trains a day?

Chairman.—That is a very big proposition. You will require 360 additional wagons and that alone will consume 24½ lacs. Then as Mr. O'Rorke said, you will have to find out your site, to acquire the land on royalty basis, and to make arrangements to build your railway sidings.

Sir M. Visvesvaraya.—You want to make sure by investigation before making a statement.

A.—Yes.

Q.—Have you been able to effect any reduction in your estimates as a result of the fall of prices since 1921?

A.—No.

Q.—For roads and lighting you have a provision of 119 lacs; could you not do with about half the sum to begin with and close the project at that?

A.—That depends on the standard of the roads that is required. The idea is to put in roads in keeping with the roads that have already been built in Bombay by the Improvement Trust.

Q.—Cannot that be left for future development?

A.—Of course that could be done.

Q.—You have effected savings under all heads except dredgers and dredging?

A.—Yes.

Q.—Assuming that the work is to be completed in six years, can you give a rough outline.....?

A.—In point of fact it is to be completed in eight years.

Q.—You have an idea to spread expenditure over seven or eight years?

A.—Yes, and of filling the blocks as required.

Q.—In order to make a forecast of work for the future, what would you take as a starting point to start fresh accounts? What would be a convenient date?

A.—30th June 1926.

Q.—You can give us figures up to that date?

A.—Yes.

Q.—From your experience have you noticed any difficulty in working the pipes connected with the dredgers? They are too long for giving the required output.

Chairman.—Are they too long?

A.—No.

Sir M. Visvesvaraya.—In the present condition of the dredgers do you expect to fill blocks 3, 4 and 5 without any difficulty?

A.—As regards block 3, I am very doubtful about filling it by dredging. Most of block 4 we can fill by dredging, I am leaving one quarter for dry filling. As regards block 3, I am estimating dry filling for the whole block.

Q.—Have you thought about the possibility of pumping by "Sir George Lloyd" and utilizing two boosters instead of one?

A.—That would not be economical, that has already been considered.

Q.—Why not? After all the dredging cost is very small, probably it will be 2 annas or 3 annas per square yard.

A.—That depends how far you want to go out to get your material. If you want to utilise the dredger and two pumping stations that means you are going out very long away from the shore.

Q.—That is just the reason why you cannot fill No. 3 by dredging?

A.—If you want to fill No. 3 by dredging you will have to build a third pipe line right through the city where it is comparatively wider and that would probably be a case of tunnelling.

Q.—Could you not avoid it by utilising three boosters?

A.—That would not assist us unless you put in shore boosters.

Q.—You have got to get the stuff across the island. Could you not utilise pipe line (No. 2)?

A.—That is not designed to reclaim block No. 3.

Q.—Could not you take out the engine from "Kalu" and put it on shore and pump?

A.—That will be somehow pumping through this pipe line. (The witness explained it on the plan).

Q.—Blocks 1 and 2 will be filled exclusively by dredging from the Back Bay?

A.—Yes.

Q.—Do you not think that further detailed investigation is necessary to make all these points definite?

A.—I think we have got information now that is necessary in order to obtain the filling.

Q.—You have no tests for gauging the progress from day to day or week to week to find out the quantity of material delivered?

A.—We take sounding which are taken every day and a return is sent in to me every week.

Q.—Do you pay any attention to the liquid in the outfall pipe and examine what percentage of silt is in suspension?

A.—No, not as a general rule, but it has been done. We keep a man stationed at the outlet of the pipe all the time and he keeps an observation as to whether there is sufficient material coming through when the dredger is working.

Q.—Is it not desirable to have a small tank or well specially constructed near the outfall to hold a certain quantity for testing the output?

A.—But the outfall is constantly shifting. You will be constantly lengthening your pipe line, and when the dredger is getting better output we have to put in sometimes several 30 feet lengths of pipes in one day.

Q.—That is not in the sea?

A.—Both in the sea and at the discharge end.

Q.—If you do not have any measurement you leave it to chance at the end of the year? What we want is that the establishment should know what work they are doing from day to day and week to week. Then they will be very careful because there will be a check over them.

A.—We have a man at the outlet to supervise the pipe line who is watching the outlet also and if the material is not coming out he sends a message by telephone from the pipe line (we have a telephone at the pipe line and the dredger) to the dredger and informs the Assistant Dredging Master who is on duty that the dredger is not pumping sufficient material and also warns him if there is a block.

Q.—You do not think any improvement can be effected either by increasing the horse power of the " Sir George Lloyd " or by improving the design of the cutter?

A.—Not of " Sir George Lloyd ". I do not know if there is any improved design of cutter, there might be but I do not know.

Q.—Would it not be advisable to consult other experts instead of depending on one specialist?

A.—The difficulty is that somebody should come out here to see and then he will have to remain here for a considerable period.

Q.—Considering the magnitude of the interest involved, is it not desirable to do all that?

A.—Yes, it might be advisable.

Q.—Do you think that before you complete your estimate now for a new start, further investigations are not necessary as regards dredging?

A.—I think we have got sufficient information.

Q.—Also for the additional rolling stock that is required?

A.—That is a question, I have not gone into. I have also not gone into the question of moorum filling for the whole area.

Sir Frederick Hopkinson.—Do you think it would be possible within the next week to get a tug and take soundings in Back Bay?

A.—No. We cannot get a tug to go round to Back Bay. It is very rough for a tug to go out of harbour. We can only get a jolly boat in the Back Bay.

Mr. Billimoria.—After the termination of Sir George Buchanan's agreement, who has been responsible officer in charge of the works?

A.—I have been.

Q.—What are your powers?

A.—My powers are limited to the powers of a Superintending Engineer under the Public Works Department rules. That is as far as my official powers are concerned.

Q.—What are the powers of Sir Lawless Hepper?

A.—I have to report and consult him on any details of the work which I consider it necessary to bring forward that is too expensive and is beyond my power of sanction. I have to submit the estimates to him. My powers are confined to sanction the work on any estimate up to the amount of Rs. 50,000. If an estimate exceeds that amount I have to submit it to Sir Lawless Hepper for his sanction, and in some cases he has to submit it to Government.

Q.—Sir Lawless Hepper has stated that he is only the administrative head, he has no experience of reclamation nor has he the requisite knowledge which is left to the engineers. He throws the entire responsibility on the engineers in India for the actual carrying out of the work?

A.—But as regards the estimates he has the power to sanction any estimates. If it is an ordinary case, that is, the estimate is below Rs. 50,000, I sanction it myself but if the estimate is over 50,000 I only approve of it and pass it on for the sanction of Sir Lawless Hepper. If the amount is above his powers (he used to have power to sanction up to 10 lakhs but I think it has been reduced now) he submits it to Government for sanction.

Q.—Have you seen Sir George Buchanan's report dated September 1923 very carefully?

A.—Yes, I have gone through it several times.

Q.—If you will look at the revised estimate of cost of scheme as submitted by him on page 29, you find that he makes an allowance of 10 lacs for the value of the plant. (It is item 14). After allowing the cost of plant he comes to the figure of 367 lacs, that is total. In this estimate has he taken into consideration the rolling stock, quarry machinery, acquisition of land and quarry? Do you find any of these figures in this estimate?

A.—No.

Q.—Do you find any item for contingencies provided there?

A.—No.

Q.—Is not it the usual practice with all engineers when they prepare estimates to make some allowance for contingencies as a rule?

A.—Yes.

Q.—Sometimes 5 or 10 per cent.?

A.—Yes.

Q.—And you do not find any item of contingencies provided for in this estimate?

A.—No.

Q.—Item No. 12 " As per Government Public Works Department Estimate " 75 lacs. That does not include any storm water drains costing £500,000?

A.—No.

Q.—Now take items Nos. 8, 9 and 10 for " murum backing to wall, murum in cross banks and murum over surface of filling ". The total provided for in this estimate for these items works out to 38,39,000?

A.—Yes.

Q.—If you will now kindly refer to the Revised Estimate which has been signed by Sir George Buchanan on the 11th February 1922 you find that he makes in the Revised Estimate a provision of 60 lakhs for moorum topping. It is item No. 7 at page 13. Can you give us any reason why there is such a considerable difference between 38 lakhs and 60 lakhs between those dates? Had the price of moorum gone up so considerably? What was the reason for revising the estimate, only one item rising from 38 lakhs to 60 lakhs?

A.—I cannot tell you on what Sir George Buchanan had based his figures.

Q.—Item No. 12 in the original estimate has in the revised estimate been put down at 135 lakhs at page 14. In the original estimate it is 75·00 lakhs. Can you tell me why there is this difference of 60 lakhs provided for?

A.—I can give you no reasons.

Q.—If you will kindly refer to the wording of item No. 12 in the original estimate, where it says, " As per Government Public Works Department Estimate, lump sum 75·00 lakhs " and compare the wording in the revised estimate, " roads, lights, etc., 135 lakhs " you find there is an increase of 60 lakhs. That provides for the extra storm water drains?

A.—Yes.

Q.—That conclusively proves that at the time the original estimate was drawn up the item of storm water drains was not considered or taken into account?

A.—That appears to be so.

Q.—If you will please look at item No. 13, " Engineering charges including all establishments " it is put at 17·98 lakhs at 5 per cent. That was increased in the subsequent estimate to 25 lakhs?

A.—Yes.

Q.—With a further contingency of further 25 lakhs for unforeseen contingencies. This item included commission payable to Sir George Buchanan? Five per cent. is for all establishment. Sir George Buchanan's firm were the Engineers. They were to get 2 per cent., and the others, 3 per cent. of the amount?

A.—I do not know whether he included his own fees in that estimate.

Q.—Do you not think when an estimate is submitted and a commission is payable to an Engineer, that ought to be included as a charge in the estimate?

A.—Probably Sir Frederick Hopkinson would be able to tell you. My impression is that a Consulting Engineer does not include his fee in the estimate. He is paid the amount in accordance with his estimate. I think the intention is that the 5 per cent. is only for the establishment.

Q.—So the original estimate in various respects as I have pointed out was incomplete and defective in many ways?

A.—Yes.

Q.—Do you think an Engineer of repute and standing would make such colossal mistakes?

A.—Not if he was careful.

Q.—I shall ask you to kindly turn to page 6 of his Report. In the 1st paragraph at page 6 he says, " Provision was made in both estimates for all contingencies that could be foreseen and a large margin was provided for unforeseen contingencies." Then in the 2nd paragraph he says, " The Governor in Council has closely examined the figures and is convinced that they have been drawn up with due care and are sufficient for immediate purpose in view, namely to show that the reclamation scheme will be a reproductive public work and as such deserves detailed investigation." Then at the bottom of the page he says, " the difficulties which have arisen with the Port Trust dredgers serve as a warning on this point." Then at page 7, " The investigation has been most carefully made and might be accepted as exhaustive. The report was clear and complete, all doubtful points had been settled and the revised estimate might be accepted as completely trustworthy and ample." Then if you turn kindly to page 13, at the bottom of the page where he gives the estimate of Mr. Kidd and himself he says, " With reference to my estimate of the cost of the work at the present time I have gone into the matter very thoroughly and I believe my figures to be reasonable and reliable. As a matter of principle I never over-estimate an estimate because although by so doing an engineer may get the credit for not exceeding an estimate, such a practice is not conducive to economic work and I prefer to make a fair estimate on the data before me and try to get within that amount." If you will kindly turn to page 14, in paragraph 43, he says, " The Back Bay Reclamation Scheme is a straightforward project without any of the difficulties that attended the Rangoon scheme." Could you now, after reading these various passages, think that Sir George Buchanan did not take the necessary care and precaution an ordinary engineer in discharge of his duties would exercise?

A.—I would not say that he was careful in spite of all these various passages.

(*Sir M. Visvesvaraya.*—These perorations are usual.)

Q.—You find that this estimate is hopelessly wrong. That is what has been proved now?

A.—Yes.

Q.—Did Sir George Buchanan prepare any settled programme of work in reference to this estimate of 367 lakhs?

A.—Not that I am aware of.

Q.—Did he draw up any plans or diagrams or designs?

A.—Except those at the end in the Report, no.

Q.—Mr. Elgee, have you seen the Report published by the Audit Officer Mr. Bean who gave evidence here, for the year 1924-25?

A.—I do not know.

Q.—He submits an annual report to the Auditor General. Have you seen his report? Unfortunately I may tell you in his report he works out the cost of dredging at Rs. 6-2-0 a cubic yard. That is on the actual expenditure incurred on dredging during the year from figures supplied by your Department?

A.—I think I have heard of that.

Q.—In these estimates both revised and original you have taken As. 5 a cubic yard. Is not that a tremendous difference?

A.—It is.

Q.—Would you account for that? One is the actual. The actual works to Rs. 6-2-0 a cubic yard?

A.—I think Mr. Bean was taking the work up-to-date and including the whole of the charges of the plant he took the total expenditure and the total quantity and divided expenditure by the quantity at that date and arrived at that figure.

Q.—He has taken depreciation into account. That does not mean the whole value of the plant. In this report he has taken depreciation into account, *i.e.*, you take into account the cost of the plant and allow at the end of the period something for what you would realise for the sale of the plant. He has spread over the depreciation to a number of years. That is the only difference.

(*Witness.*—How many years has he spread it over?)

Q.—He has taken a round figure for depreciation. We are going into that. Now I shall ask you some questions regarding the "Jinga." I find you have not been asked anything about that. Why was she purchased at all?

A.—Because it was necessary to work a booster in conjunction with the "Kalu."

Q.—Has she ever been used since she was purchased?

A.—Not yet.

Q.—When was she purchased?

A.—On the 30th March 1925.

Q.—£10,000 was paid for it?

A.—Yes.

Q.—How long has she been in the dry dock?

A.—Ever since she was purchased. Soon after she was purchased she was put in in the dry dock.

Q.—Do you know what the bill of the dry dock will come to?

A.—We have got an estimate that includes docking charges. They are working on a percentage basis. They are not charging the ordinary dock charges.

Q.—Have you any idea as to what it will come to?

A.—We have got a total estimate for the repairs and for reconditioning. It is Rs. 5,50,000.

Q.—That would be about £40,000?

A.—Yes.

Q.—So you paid £10,000 as the cost and £40,000 is for her lying there in the dry docks?

A.—Yes, where she is being reconditioned.

Q.—Have you reported this to the Accounts officer that there is this liability pending not taken into account?

A.—All estimates were sent to him. It has been sanctioned by Government.

Q.—No payment has been made in respect of this dry dock bill?

A.—I think a number of bills have been sent in and paid.

Q.—Do you know what the liability is?

A.—I believe at the present time the total expenditure to date has been Rs. 5,06,701.

Q.—How old is the ship?

A.—She was built in 1908.

Q.—She is nearly 18 years old?

A.—Yes.

Q.—What is the usual life of a dredger?

A.—It depends on the amount of work it does.

Q.—She has practically finished her life more or less?

A.—Well, the hull has. The hull requires a certain amount of reconditioning, but we bought her originally with the intention of taking the engines out of her and utilising the engines and the pump.

Q.—So you paid £10,000 for the engine?

A.—Yes.

Q.—The engine is not used and interest is running on?

A.—When we purchased her we intended it to be used as booster, but she has not been really required for work until this season.

Q.—What is the value of spare parts in connection with that?

A.—There was a new pump and various replacements.

Q.—What does that cost you?

A.—I cannot tell you at the present moment.

The Committee met at the Legislative Council Committee Room at 10-45 a.m. on Wednesday, the 18th August 1926, Sir M. Visvesvaraya occupying the chair, the Chairman of the Committee Sir Grimwood Mears being absent on account of indisposition

Further examination of Mr. C. R. Brims, Deputy Chief Engineer

Mr. C. R. Brims, Deputy Chief Engineer, was examined again.

Sir Frederick Hopkinson.—We have to ask you a few more questions in continuation of what we asked you the other day. The principal thing is why the "Sir George Lloyd" was worked only one shift in the first season ?

A.—In the first season we only had one dredging master Mr. Speirs to take control of the bridge and work the ship and we only had one shift. With the engineers before us it was impossible to work two shifts. Two assistant dredging masters arrived in February 1924. They were untrained men and we had to train them during the first season of 1923-24.

Q.—Did any more engineers come in February 1924 ?

A.—No. The engineers for the double shift were not required until the following season, because the two assistant dredging masters were untrained and they could not be left in charge of the bridge.

Q.—Had the assistant dredging masters been trained, you would have required engineers?

A.—Had the assistant dredging masters been experienced, we would have required engineers.

Q.—Were no engineers sent out with the assistant dredging masters ?

A.—No, on account of the assistant dredging masters not being trained.

Q.—Was that arranged in London ?

A.—Yes, I believe it was.

Q.—So that really in the first season you were running the "Sir George Lloyd" largely to train two assistant dredging masters ?

A.—The dredging master Mr. Speirs was getting the output out of the ship and at the same time training the men. He remained on the bridge the whole time working the ship.

Q.—Had you had experienced and trained dredging masters, there was no reason why you should not have worked two shifts in the first season ?

A.—No reason, had the assistant dredging masters been experienced.

(Mr. Brims then withdrew.)

21st Witness

Sir Dinshaw Petit, Bart.

Sir Dinshaw Petit representing the Bombay Presidency Association was then examined.

Statement by Sir Dinshaw Petit, President, Bombay Presidency Association.

Happening to be a member of the Governor's Legislative Council at the time the reclamation scheme was introduced I can say with some personal knowledge that it received the support of the non-official members as it was felt that if carried out at the figures mentioned at the time the reclaimed area would be a great acquisition for Bombay. Accepting the figures of cost which were then given out the margin between the cost and the probable value that could be realised was so large that its success was not doubted. The would-be price of the land when put in the market was considered by those who supported it not on the basis of the boom price that was ruling then but on that of the price that could be fetched in ordinary times. The figures of cost as given out by Government were readily accepted as nobody could imagine that a responsible body like the Government of Bombay could have treated a matter of such importance so light heartedly and had arrived at the estimate then declared in a manner so superficial as it has now turned out to be. Large estimates are apt to vary but not generally by more than ten, fifteen or twenty per cent. and therefore the Councillors who supported the scheme believed they were quite on the safe side even if the estimate increased in actual working by fifty per cent. In the Council several non-official members pressed for an executive committee representative of the public to be associated with the Government department carrying out the development schemes but in the select committee the chairman Sir George Curtis ruled this proposal out of order and in the Council it was stated that at that juncture such a committee was not needed, but later on the reformed Council could take the question up if it so desired. If such a committee had existed the great blunders which have caused the abnormal increase

in the cost of the reclamation might not have happened, or might at least have been detected in time to save a considerable loss of money, and in any case the public would not have been kept in the dark for such a length of time. When insinuations were made openly against the executive of the development my Association (The Bombay Presidency Association) could not believe that the Government could allow such grave irregularities to exist in one of their departments, but now that there is no doubt left as to their existence it is much to be deplored that in the Council reassuring statements were made on behalf of the Government even when they should have known that all was not going right with the scheme and that financially it was going to be a huge failure. When the majority and the minority reports of the Committee appointed at the recommendation of the Advisory Committee were out my Association felt no doubt that there were some grounds for the grave insinuations that were made in public and lost no time in representing to the Government that an enquiry committee should be appointed, and they feel grateful to the Government of India for having appointed this Back Bay Enquiry Committee. In order to save the prestige of Government from such a state of affairs happening again and the people from the hardship consequent on the handling in such a manner of important schemes, and in order that responsible parties should know that the finances of the city and the Presidency are not to be trifled with and in order that incompetent persons should not take upon themselves duties which they are not capable of properly discharging my Association prays that the Committee will leave no stone unturned to apportion the blame of neglect or dishonesty as the case may be to the individuals associated in this work, and to bring them to book. The Back Bay as it existed before the reclamation work was begun, neglected as it was, was a spot of great natural beauty which evoked the admiration of many a traveller and if the works are left incomplete Bombay will have been robbed of one of its most prominent and pleasing features, and therefore the scheme should be as far as possible completed at the minimum of loss which could be spread over for payment over a period of many years, in order that it may not be felt too harshly by the present generation.

Sir M. Visvesvaraya.—You are the chairman of the Bombay Presidency Association ?

A.—Yes.

Q.—You say, " I can say with some personal knowledge that it (the reclamation scheme) received the support of the non-official members at the time "?

A.—Yes.

Q.—The non-official members of the Governor's Legislative Council approved of it ?

A.—Yes.

Q.—And they had no doubt about the success of the scheme ?

A.—They had no doubt.

Q.—You say in the Council several non-official members think that an executive committee representative of the public should be associated with the Government Department which is carrying out the development schemes ?

A.—Yes.

Q.—How in your opinion was that committee to be constituted ?

A.—By asking the Municipality, the Port Trust, the Improvement Trust and other public bodies to send in their representatives.

Q.—Was it to be an advisory committee ?

A.—An executive committee.

Q.—How many members in your opinion should have constituted the committee ?

A.—About 8 or 9.

Q.—How many are there in the present Improvement Trust ?

A.—I do not know.

Q.—Would not nine be an unwieldy number for an executive committee ?

A.—I would not think so.

Q.—Assuming that the work is to be proceeded with in future, what do you wish done in the matter of a committee ? Do you think that a committee should be appointed in order to carry forward the work in future ?

A.—Yes. No steps should be taken by the executive body without consulting the committee. They should be passed by the committee.

Q.—You want an executive committee appointed to supervise the construction of the works in future ?

A.—Yes.

Q.—You say that " The Bombay Presidency Association could not believe that the Government could allow such grave irregularities to exist in one of their departments." You refer to the conduct of the works ?

A.—The way in which they have been carried out.

Q.—Could you mention some of the irregularities there ?

A.—Ordering costly machinery and dredgers before they could be used ; the loose way in which the specification was made ; and the loose way in which the original estimate was made. These are all what I call very grave irregularities.

Q.—Are there any specific points to be investigated to which you wish to draw the attention of the Committee ?

A.—I think the whole scheme has been so badly managed that the whole matter should be investigated. Of course there will be several points ; for instance, Sir George Buchanan ordered out a dredger which was not suitable for dredging the material which was in the harbour, although, I believe, it was reported before he ordered it what sort of material was there. There may be several such points.

Sir Frederick Hopkinson.—That is a point of course which this Committee is investigating.

A.—Quite so.

Q.—Have you any facts to tell us which will be of help to us ?

A.—I was not connected in any way with the Council after this was done.

Sir M. Visvesvaraya.—You might consider that some points are likely to escape the notice of the Committee ?

A.—There are none that I know of.

Q.—Supposing you had your own way, how would you like the scheme to be dealt with—I mean about the completion of the work ? By what agency and by what methods ?

A.—I cannot say that. That is for the Committee to decide. They are investigating the whole affair and they would know better than anybody else.

Q.—Do you wish to complete the work or leave it half finished ?

A.—I would like to have it completed.

Q.—How much would you spend per square yard in order to complete the work ?

A.—My idea is that it would cost about 50 to 60 rupees. There are some chances of not making a huge loss.

Q.—Suppose you could complete it at Rs. 10 per square yard : you will accept the idea ?

A.—Yes, of course.

Sir Frederick Hopkinson.—You spoke just now about a committee of nine being appointed to manage or advise the construction ?

A.—Not quite to manage, but to see that no important step is taken without its being sanctioned by the committee.

Q.—Supposing it was decided to let the work by contract, an important step would be taken at first and there would be no use of a committee thereafter ?

A.—Unless there was no variation in the way the work was to be executed. After it is proceeded with, there might be reasons for the contractors to come to the Government and say that they cannot carry it out in that way.

Q.—They have got the contract and they must carry it out ?

A.—I mean to say that points may arise by which it may be better in the interests of Government and the contractors to vary the form.

Q.—What you mean is that you would like the Government, before making any alteration in the scheme as detailed in the contract, to consult the committee you are speaking of ?

A.—Quite so.

Q.—You do not suggest that this committee would be of the slightest use in managing or controlling the execution of the work ?

A.—Not, if it is given by contract.

Q.—If it were done departmentally ?

A.—I would certainly think that the committee would be of use.

Q.—Are the members of the Committee you suggest experienced in the conduct of such work ?

A.—That depends on how the committee is constituted. Some of them might have some engineering knowledge.

Q.—But the mere fact of being the President of a public body in Bombay would not give that president any technical knowledge ?

A.—Not simply on account of being a president.

Q.—Don't you think it would be a better plan if Government decided to finish the work, to hand it over to one experienced and competent man and make him entirely responsible for it ?

A.—Well, I think that was the idea when Sir Lawless Hepper was appointed, and there might be a repetition of the same history.

Q.—You are afraid of that ?

A.—Yes.

Q.—I may take it from this statement of yours that the Bombay Presidency Association were enthusiastically in favour of the scheme as originally laid down ?

A.—There was no resolution indicating such enthusiasm, but that is my feeling.

Q.—Had the works been carried out at the original estimate, or within a reasonable variation, you think it would have been an excellent thing for the city of Bombay ?

A.—I have no doubt about it whatsoever.

Q.—And that not on the basis of the boom prices then ruling but on that of the prices ruling at ordinary times ?

A.—Quite so.

Q.—You speak in your statement about " grave irregularities " in the department of the Development Directorate. Is that so ?

A.—Yes.

Q.—Do you mean any irregularities against any particular person ?

A.—No. Irregularities in not carrying out things in a business-like manner.

Q.—You have no charges of a personal nature to make against any one ?

A.—No.

Q.—But you thought it was not being managed in a business-like and proper manner ?

A.—Yes.

Q.—You state also that " reassuring statements were made on behalf of Government even when they should have known that all was not going right with the scheme and that financially it was going to be a huge failure ". Is that proved yet ?

A.—Practically it was. It may not now be if the way in which it has been done is altered in time.

Q.—You think it is possible at the present moment that it may be turned into a success ?

A.—It may be quite possible, if efficiently and economically controlled.

Q.—You say again that on the receipt of the Advisory Committee's report your association felt no doubt that there were some grounds for the grave insinuations that were made in public. Can you give us any notion of what these insinuations were ? Can you give us any facts ?

A.—The remarks that were made in the Council by Mr. Nariman.

Q.—Did they refer to any personal irregularities or were they only general remarks ?

A.—I cannot say they did refer to personal irregularities. I do not quite remember.

Q.—Irregularities in the sense of bad management and not in the sense of personal irregularities ?

A.—Yes.

Q.—Further down in your statement you say that " responsible parties should know that the finances of the city and the presidency are not to be trifled with and in order that incompetent persons should not take upon themselves duties which they are not capable of properly discharging ". What do you mean by taking upon themselves ? Is not Government entirely responsible ?

A.—Government are responsible, but they have made several appointments in connection with the scheme.

Q.—You say " take upon themselves " referring to incompetent persons. Are there any incompetent persons who took upon themselves anything that they had no right to take ?

A.—Those who have allowed this irregularity have proved their incompetency.

Q.—Who has taken upon himself these duties which he is incapable of properly discharging ? Can you give us any instance ?

A.—The man who has ordered the dredger.

Q.—But he has not taken it upon himself. He was appointed by the Government ?

A.—That is what I meant.

Q.—You do not mean that any one has overstepped his bounds ?

A.—No.

Q.—You use a very ugly word here—" dishonesty ". Can you tell me what you mean by that ?

A.—I qualify that by saying " as the case may be ".

Q.—Can you give me any instance of dishonesty ?

A.—I cannot.

Q.—Do you know of any one ? We should be only too glad to investigate.

A.—I cannot.

Q.—Can you give us any specific instances of neglect ?

A.—The slipshod way in which the first estimate was prepared. That is an instance of neglect.

Q.—You are assuming that there has been neglect ?

A.—To my mind, there is no doubt about it.

Q.—You say in your general conclusion that " the scheme should be as far as possible completed at the minimum of loss. " That is the idea of the Bombay Presidency Association ?

A.—Yes.

Mr. Billimoria.—Sir Dinshaw Petit, you are one of the largest landlords in Bombay ?

A.—I won't say so.

Q.—You own a very large number of lands and buildings in the City ?

A.—I know that is the general idea, but it is a very mistaken one.

Q.—You don' t want to have that credit for yourself ?

A.—No.

Q.—You have been a member of the Legislative Council and the Municipal Corporation for a number of years ?

A.—Yes.

Q.—So you are very intimately connected with the city of Bombay as one of its principal responsible citizens ?

A.—Yes.

Q.—You are also a large millowner and have intimate knowledge of the conditions of life in Bombay ?

A.—Yes.

Q.—Being connected with the key industry of this Presidency—I mean the textile industry—you know that that industry is practically passing through a stage of crisis ?

A.—Yes.

Q.—And that Bombay is not at all prosperous ?

A.—I know that to my cost.

Q.—It is very difficult to state when conditions may improve in Bombay ?

A.—Very difficult to say that exactly to a month or a year, but it is my idea that it will improve at no distant date.

Q.—You don't expect it to be very distant ?

A.—No.

Q.—You expect prosperity in Bombay in the next few years ?

A.—I see better times in store, I won't say prosperity.

Q.—Do you think there are prospects of the repetition of the boom that we had experienced between 1920 and 1922 ?

A.—I don't think, within this generation.

Q.—This scheme was the topmost failure of Bombay ?

A.—Very nearly I should think so.

Q.—The year 1920 was the best period that Bombay had ever seen in its history ?

A.—Yes.

Q.—In your statement you say " Accepting the figures of cost which were then given out, etc." ; you mean the estimate of 367 lakhs ?

A.—Yes.

Q.—And the figures worked out at Rs. 56 per square yard of land available ?

A.—I thought it was Rs. 22. That was on the basis of 702 lakhs, but I am not quite sure. But I think the figure then worked out at Rs. 22 per square yard. That is my impression after calculating everything, deducting for roads, paths, etc. I may be wrong.

Q.—That was after taking into account the interest on the money spent on the scheme ?

A.—I do not know ; they are supposed to have taken that into account. I do not know whether they did or not.

Q.—What was the prospect at that time of land being sold ? At what price ? You say in your statement that it was not " on the basis of boom price that was ruling then but on that of the price that could be fetched in ordinary times " ?

A.—At that time, anything between 300 and 400 times.

Q.—In ordinary times what would you expect ?

A.—Between Rs. 55 and 75.

Q.—If on completion of the scheme, the cost works out to Rs. 55 or more than 55, would you consider it a reasonable and productive proposition and financially sound ?

A.—Apart from that, my feeling is that we have got to face it ; that is it.

Q.—We have incurred a loss and we must face it boldly ; that is your feeling ?

A.—We are in the soup : we have to see through it now.

Q.—Further, in your statement you say " Large estimates are apt to vary but not generally by more than 10, 15 or 20 per cent. ". I take it that this was your experience ?

A.—Yes.

Q.—You based this on your own experience, or this is the common knoweldge of all bodies that estimates are not expected to be exceeded beyond 20 per cent. ?

A.—If the work originally intended is adhered to. Very often estimates are made and then the cost is increased.

Q.—That is a different matter. If I want to build a room and instead of that I want a spacious hall surely it would make a great difference. But in ordinary circumstances the estimate is not likely to be exceeded by 20 per cent. ?

A.—Yes.

Q.—When an estimate is exceeded by more than 300 per cent., would you call it a prudent business proposition ?

A.—Absolutely not.

Q.—In your evidence in your reply to Sir Frederick Hopkinson you said that Government would be responsible and they were to blame for having launched the scheme and put incompetent persons ?

A.—Government appointed incompetent persons.

Q.—Supposing certain estimates were submitted to Government for certain classes of work, and then those estimates had been exceeded, Government as such had not the technical knowledge and naturally they had to depend on experts, would you still blame the Government or the expert ?

A.—If they had taken sufficient precautions to have that expert' s knowledge checked by other experts, I would not blame. But if they depended entirely on one man or two men, then I certainly would blame the Government.

Q.—Would you not apportion the blame to the party misleading them in that direction ?

A.—Certainly I would.

Q.—Have you any idea of the values of land at Marine Lines, Queen's Road, Colaba ? That is where the present scheme is confined to. I am asking a general question.

A.—I have no personal knowledge of the value of land there, but I can gauge it from the value of land elsewhere in the city of which I have some personal knowledge.

Q.—Depending on that you gave us the figure of Rs. 55 to 75.

Sir Frederick Hopkinson.—That is for, the whole area on an average ?

A.—Yes.

Mr. Billimoria.—You must be aware that there is a very large area of land available in the city of Bombay. If you had seen the majority report you would have noticed that 86,82,871 square yards of land are vacant and available immediately for building purposes in the town of Bombay.

A.—In the north.

Q.—The lands under the Improvement Trust, Municipality and Port Trust, Railway lands at Colaba, G. I. P. lands at Colaba, military lands at Colaba, the property of the Colaba Mill Company, and so on.

A.—Yes.

Q.—Having such a large area of land available in the town itself, do you think there was an urgent necessity for an immediate undertaking of this reclamation work ?

A.—I do not think there was an urgent necessity for an immediate undertaking.

Q.—Do you think that the scheme had a reasonable prospect of being a productive one at the time ?

A.—Yes.

Q.—What is your feeling now ?

A.—My feeling is that it cannot be productive.

Q.—The reclamation did not offer a reasonable prospect of being a productive one ?

A.—No by the way in which it has been carried.

Sir Frederick Hopkinson.—Notwithstanding that, you think it may, and in any case it would be a wise thing to complete it ?

A.—That is my notion.

Mr. Billimoria.—With regard to the completion of the scheme, you say it would be wise to complete it. Do you know that up to the end of June last 5·67 lakhs have already been spent on the scheme ?

A.—Yes.

Q.—In order to complete the scheme, a further expenditure of seven crores would be necessary ?

A.—Eleven crores is the estimate.

Q.—After providing for roads, open spaces, paths, etc. It has been suggested that 22 lakhs of square yards of land would be available for public purposes, for buildings, etc., Do you think

that such a huge expenditure on an area of 22 lakhs square yards would result in a profitable proposition in the end ?

A.—It is doubtful.

Q.—You also know that it will take a number of years to have the scheme completed ?

A.—It depends on what you call " a number of years."

Q.—We had several witnesses here who had put it roughly between 10 and 15 years—engineers and others.

A.—I am afraid that is an engineering question.

Q.—If it takes 25 or 30 years for the completion of the scheme, the interest would pile up on the large amount of money that would be spent, so that at the end of the period, the 11 crore estimate would be more than double.

A.—At the end of 30 years, naturally.

Q.—As such it could never be a business or financially sound proposition ? You agree in that ?

A.—Yes, granted it has not been completed within 30 years.

Q.—Having regard to that, would it not be prudent to complete a few blocks that have to be completed and on which work has already been started and to await the result ?

A.—No ; I do not think so.

Q.—You would have the scheme completed, and face the loss whatever it is ?

A.—To a reasonable extent.

Q.—That means you would not launch the whole scheme but go slowly and cautiously ?

A.—Yes. But I would complete the scheme as quickly as possible.

Sir Frederick Hopkinson.—Is that your personal opinion or the opinion of the Bombay Presidency Association ?

A.—My own personal opinion.

Q.—You don't speak for the Bombay Presidency Association ?

A.—No.

Mr. Billimoria.—Then in your statement, you are putting forward a grievance that in the council several non-official members pressed for an executive committee representative of the public to be associated with the Government department for carrying out the development schemes, but that in the select committee, the Chairman Sir George Curtis ruled this proposal out of order. Have you any authority to say that ?

A.—Oh, yes. I myself pressed for such a committee and I was ruled out of order.

Q.—You speak from your own personal knowledge as to the statement made here ?

A.—Yes.

Q.—Do you know the reason why Sir George Curtis ruled it out of order ?

A.—He could have thought it out of order, and ruled it so.

Q.—He thought that the committee at that juncture was not needed ?

A.—I won't say, I am not quite sure as to who said that, whether it was the Governor Sir George Lloyd or Sir George Curtis, but somebody on behalf of the Government said so in the Council. I think Sir George Curtis said it ; you will find it in the reports of the council.

Q.—Then you proceed with your statement and say, " and in any case the public would not have been kept in the dark for such a length of time." What you mean by " being kept in the dark for such a length of time "?

A.—We had very reassuring statements in the council made by Sir Chimanlal Setalvad and others, and if there was an executive committee working jointly with the Directorate then surely all would not have sat silent and given the reassuring statement ; the public would have known what they are doing.

Q.—So the feeling of your association is that if the public had been taken into confidence the financial ruin which has been complained of would to a large extent have been avoided ?

A.—Would have been checked.

Q.—Then you say when insinuations were made openly against the executive of the Development ! What were the insinuations ? Who made them ?

A.—The insinuations made by Mr. Nariman, in particular.

Q.—In the council ?

A.—Yes.

Q.—When Mr. Nariman comes we will ask him about it. Then Sir Fredrick asked you about the grave irregularities you say as existing in the department. I suppose you refer that also to Mr. Nariman ?

A.—The very fact of the increase of the estimate by 300 per cent. means that there must be grave irregularities in existence.

Sir Frederick Hopkinson.—Don't you mean this that as the cost has increased so enormously there must be grave irregularities ?

A.—Quite so.

Q.—You don't know of any specific ones ?

A.—Except what I have heard from general reports.

Sir M. Visvesvaraya.—Do you know of any people who can give us specific instances ?

A.—Perhaps Mr. Nariman may.

Mr. Billimoria.—When Mr. Nariman comes we shall ask him about it because he has been making these insinuations. Then, you have on the second page of your notes " that all was not going right with the scheme and that financially it was going to be a huge failure " and events have proved it : and if this scheme with interest piling up in a number of years when it is completed is going to cost you several crores of rupees, the prospects of realising 30 to 50 crores have not only evaporated in the air, but we are faced with a distinct vision of a huge loss. That is what you refer to by huge failure ?

A.—If it is continued in the same fashion.

Q.—Would you suggest other alternatives ?

A.—No ; I would leave it to the department to suggest.

Q.—This committee has to consider whether the scheme is to be abandoned at present or to be completed in part or in the alternative completed in its entirety as originally planned or with modifications as regards the methods of execution. Have you any suggestions to make with regard to any of these alternatives ?

A.—I would have it completed as far as possible.

Q.—Then, you have been good enough to thank the Government of India, expressing your gratitude for having appointed this Enquiry Committee. Now that this committee has been appointed and is working have you anything definitely to suggest or to propose to the Committee as to what the committee should do. The committee is now sitting in enquiry, would you like the committee to make enquiries in any particular or definite directions ?

A.—I think it is, from all reports, doing all that it is expected to do.

Q.—Thank you very much, Sir Dinshaw, for the compliments. Then you proceed further and say " that the Committee will leave no stone unturned to apportion the blame of neglect or dishonesty as the case may be to the individuals associated in this work." Would you be more candid with regard to this and say what you convey by this ?

A.—What I mean is this, that unless there is gross negligence there cannot be this increase in the estimate. Therefore it is for the committee to find out who are the responsible persons for having landed us in this quandary.

Q.—In reply to a question from Sir Visvesvaraya you said something with regard to a committee being appointed for the future prosecution of this work. Could you suggest anything with regard to its constitution ? Would you like business men to be associated with that committee, or engineers and financiers to be put on the committee ?

A.—I would ask public bodies, responsible public bodies, such as the Bombay Corporation, the Mill Owners' Association of Bombay, the Chamber of Commerce, the Indian Merchants' Chamber of Commerce and such bodies, to appoint their representatives, and the Government will also appoint one or two experts, to constitute this committee.

Q.—Do you suggest that that committee is to be a sort of advisory committee or a sort of executive body ?

A.—Executive body. What I mean is this, that no improvement scheme is to be undertaken without its being passed and approved by the committee.

Q.—If it is suggested that this work is to be proceeded with would you suggest or recommend the transfer of a portion of the activities of the Development Department to the Public Works Department, or would you suggest any other agency for taking over and getting on with the work ?

A.—I think this committee would be the best body to decide that question.

Q.—So you would desire that Government should carry on with the advice and co-operation of the committee constituted by representatives of public bodies ?

A.—By what agency I would not say that ; It would be for this committee to recommend.

Sir. M. Visvesvaraya.—If it is decided to do the work by moorum filling are there local contractors who could carry out the works ?

A.—It is more than what I can say. I have no idea.

Q.—There is some misapprehension about the area to be reclaimed. The total area is 55 lakhs of square yards, and the net building area will be about 22 lakhs square yards. As to cost various figures have been mentioned Rs. 40 per square yard and 50 per square yard. These figures refer to the net building area, not to the total 55 lakhs of square yards. Now if you get

55 lakhs of square yards at Rs. 10 per square yard—it would cost you Rs. 10 per square yard to reclaim—have you any objection ? Out of 55 lakhs, 45 lakhs remain to be completed. So if it is proposed to complete this 40 lakhs at a cost of Rs. 10 per square yard would you object to that ?

A.—Calculating what has already been spent?

Q.—No ; additional. Whatever has been spent is spent. There is no going back. There is no means of wiping off that loss ?

A.—I have no objection whatever.

Q.—If the work can be done cheaper you would complete it ?

A.—Yes.

Q.—In the shortest time possible ?

A.—Yes.

Q.—You may be able to wipe off the loss if the work is done expeditiously ?

A.—Yes.

Q.—If the Public Works Department took over the work you can still employ contractors ?

A.—I don't know ; I have no idea.

Q.—Is it the opinion of the public of Bombay also that the work should be completed expeditiously ?

A.—That is a divided opinion. I have talked with many ; some say it should be completed ; some say it should be abandoned, only what is incomplete must be finished.

Q.—It depends on the cost ?

A.—Yes, of course.

Mr. Billimoria.—Just one question. Sir M. Visvesvaraya just now put to you some definite figures with regard to reclaiming this land at Rs. 10 a square yard. Those are hypothetical figures.

Sir M. Visvesvaraya explained that for the next few years they might adopt that figure, as the work would consist of filling in with mud, and no dredgers or anything would be required. As to how long it would take that depended on the facilities afforded by the two railway companies, and if they could agree between themselves to give 20,000 cubic yards a day, they could finish it quickly.

The witness withdrew.

22nd Witness

Mr. N. D. Kanga

Mr. N. D. Kanga, Civil Engineer, was called in and examined.

Sir M. Visvesvaraya.—What is your full name ?

A.—Nusserwanji Dorabji Kanga.

Q.—Your profession ?

A.—Architect and Civil Engineer.

Q.—You are constantly in touch with the prices of land in the neighbourhood of the Reclamation area ?

A.—Yes.

Q.—Are any sales being effected nowadays ?

A.—Yes, I should say on Queens Road. I remember two sales. One was the day before yesterday. That was a small compact plot at Rs. 200. Another plot was sold for Rs. 160, near the industrial centre. All these were small plots.

Q.—What is the price of land in the neighbourhood of the area to be reclaimed, at the Marine Lines end ?

A.—There are several factors to be taken into consideration before giving the answer. The question is what the area and the period of disposal would be. The purchaser will take into consideration all those factors. Taking the Colaba end, the Improvement Trust realised about Rs. 35 per square yard. That was about 15 years ago. The principal question will be about the period of the disposal.

Q.—What will be the period to get that high price ? The area is about 22 lakhs of square yards ?

A.—I want the total area for building.

Q.—Including the open spaces it will be about 55 lakhs of square yards ?

A.—The public has nothing to do with the open spaces. Roads and parks should be left out.

Q.—The net building area is about 22 lakhs of square yards ?

A.—There will be about 2000 square yards in one plot. You will sell about 2000 square yards in one plot.

Q.—You might mention the conditinos if you like and then give us the price you think is reasonable ?

A.—The principal question will be about the sinking fund. Twenty-two lakhs of square yards will mean about 1100 plots. If you dispose of about 30 plots a year it will take about forty years. I do not think you will be able to dispose of more than 30 or 40 plots a year.

Q.—Will not all the buildings be located there, on the Hornby side ?

A.—Provided you take the industrial user. There is the question of the restrictions you put on the plots. If you sell only for residential purposes as in Salsette the value of the plot is greatly restricted. If you take thirty years as the period of disposal, you will have to set apart a sinking fund.

Q.—If you take thirty years what will be the prices ?

A.—On the day of start ? It means 60 per cent. of the total value. You may be able to realise about Rs. 40. The principal point is the sinking fund.

Q.—Would it be reasonable to assume that Rs. 40 would be realised for that area ?

A.—On the day you complete the whole thing ? I should say it would be Rs. 40. On the day you complete the whole scheme—complete with roads and everything else—you can realise Rs. 40. I don't think you will find the immediate market for that price. You take your own time and see the tendency in the market. The demand will be the same. As the supply gets less and less, the vendor will realise more. But the period of disposal is the principal thing even if you set apart sinking fund at 4 per cent.

Q.—But the prices will vary between the Marine Lines end and the Colaba end ?

A.—Oh yes.

Q.—I take it that Rs. 40 was the average ?

A.—I meant that.

Q.—What figure will you give for Marine Lines ?

A.—I should say you will get about Rs. 125 for a large area and the buildings in the rear will fetch less. Again, the question is whether Queens Road is for industrial purposes.

Q.—I don't know what the object of the Government is. It is not likely that it would be used for industrial purposes ?

A.—Then the Queens Road would not fetch so much.

Q.—You may assume it for offices and Government buildings.

A.—Then I don't think any purchase in the market is necessary. If you want to let out these blocks for the public then the first question is what use you expect from it. If it is not reserved for the public then the Queens Road will not fetch the same price as the buildings near the sea. I assume that the railway goes away.

Q.—Will not the public take that area because of the favourable position ?

A.—Certainly because of convenience, towards the north of the Fort, between the Churchgate Station and the Marine Lines. These blocks (Nos. 1 and 2) are most favourable and valuable for building purposes as they are in the centre of the business area.

Q.—Colaba area will be taken up by the Military.....

A.—That is the Wodehouse Road. Here are the Improvement Trust Plots. They realised in all about Rs. 35 per square yard. For some of the inner plots away from the sea they realised about Rs. 25 or something like that.

Q.—How long ago were the sales effected ?

A.—I think about 1912. The prices of land had considerably increased since 1912. Actually the boom started about the year 1918 after the Armistice and the prices went up in 1919 and went up to the top in 1920. After the last quarter of 1920 the fall began and it still continues.

Q.—Already 15 lakhs of square yards have been reclaimed ?

A.—Yes.

Q.—And there are still 40 lakhs remaining to be reclaimed. Would you proceed with the work in expectation of profitable sales ? One thousand and one hundred plots are estimated to cost 4 crores ?

A.—I cannot say about 4 crores.

Q.—That is for the building area of 22 lakhs ?

A.—This is what I believe would cost : assuming 2000 yards a plot, 22 lakhs of square yards at the rate of Rs. 40 a square yard will realise about Rs. 8,80,00,000.

Q.—Is there any prospect of realising that ?

A.—I said it would take about thirty years, if you put all the plots in the market. I assume that you sell about 30 to 40 plots a year. The Improvement Trust and the Municipality take into consideration the sinking fund.

Q.—Are you in favour of completing the reclamation area or leaving it incomplete ?

A.—To leave the scheme incomplete in my opinion is an eye-sore. To leave the scheme incomplete will be something like treating the money spent as bad debts. The only question is whether you are going to recoup the loss by spending more or increase the loss.

Q.—Supposing you are likely to recoup the loss ? If you can get Rs. 40 rate, in 10 years you can recoup the loss ?

Sir Frederick Hopkinson.—Rs. 40 is based on the 30 years' period.

Sir M. Visvesvaraya.—You will have 22 lakhs of land available on the day of starting and if you sell at Rs. 40 you will get about 8 crores, nearly 9 crores. The area to be reclaimed is about 40 lakhs of square yards. The area to be reclaimed is 40 lakhs of square yards and it will cost only 4 crores. In it is included the 22 lakhs of square yards. If the circumstances are just what you said, would you recommend the scheme to be completed or not ?

A.—Certainly, I would.

Sir Frederick Hopkinson.—I should like to make it clear that these estimates or cost of completion are not the considered estimates of the Committee?

A.—No. Rough estimates.

Q.—Not even as rough estimates of the Committee, because we have not considered it. They are an assumed cost ?

A.—The only statement I can make is that on the day of completion you can expect Rs. 8 crores. The Rs. 40 rate is spread over 30 years. I assume that the plots are in the market. I don't think I shall be so pessimistic as regards plots on the Queens Road.

Q.—Will the prices of land generally go down very considerably if there is a lot of new land ?

A.—That depends on the use of the land. If you get it for residential or industrial purposes, I don't think there is any chance of the plots going down in Fort at least. But the prices will go down a little to the north of the Fort, near Worli, Warden Road, etc.

Q.—What are the prices on the Hornby Road in the centre of the town ?

A.—I should say about Rs. 300 today. Originally it was Rs. 1,300 in boom time. A good plot I should say would fetch about Rs. 400. But there are no vacant plots. Buildings are actually built over. I think there were some sales which shew about Rs. 400 to 500. I think one or two plots have actually changed hands. That is on Hornby Road, to the west of it, occupied by banks.

Q.—Is there any large demand for land for public buildings like hospitals or public offices and business offices ?

A.—I can say there is some demand among business people. The Municipality is going on with its Hornby Road Scheme and therefore there may not be any competition. It depends on the centre of the banks. If Government wishes to move the banks the demand may be less. Then the question of the prohibitive cost of the construction comes in. If you intend to construct, I mean the purchaser will consider that heavy foundations will be necessary, and thus the cost will be prohibitive.

Mr. Billimoria.—Mr. Kanga, you have a great deal of experience as an Engineer in Bombay. You have been retained by the Improvement Trust and the Bombay Municipality and the High Court of Judicature has always quoted your opinion as an expert.

A.—I have given evidence in several cases. I was retained by the Municipality and the B. B. & C. I. Railway.

Q.—Do you think from your experience and connection with the town and city of Bombay, if such a large area as 22 lakhs of square yards were thrown open in the market there would be immediate demand ?

A.—If you spread it over for 30 years, I think the plots will be disposed of at the rate of 30 or 40 plots a year.

Q.—While suggesting these 30 years, have you taken into account the vast area of land that is now lying vacant in the city itself, approximately about 90 lakhs of square yards ?

A.—I think that the price of this land will go down in view of the scheme.

Q.—There are some plots in Colaba. Will they not directly compete with the reclaimed area. The area available from the Colaba end to the Marine Lines end is 171 lakhs, the G. I. P. and the B. B. & C. I. Railway lines, all these amount to about 400 lakhs of square yards immediately available for building purposes. They don't require the foundations that you have mentioned. Do you think there will be a demand for the land on the reclaimed area ?

A.—That is why I said spread it over 30 years. It is a fair estimate.

Q.—You don't suppose these lands will compete ?

A.—They will compete. That is why I said Rs. 40 will be a fair rate. I don't think they are prepared to sell at Rs. 40. Large area has to be divided into plots, and if you divide, a good deal of land will have to be thrown out for open spaces. Then this 400 lakhs of square yards will be reduced.

Q.—Mr. Kanga, you referred to Improvement Trust Plot in Colaba, by which you mean I suppose the Cuffe Parade and the Railway Station and the back side. On an average, this

realised Rs. 35 fifteen years ago. That is a small area. With a huge area which you see on the front of it, do you think, inspite of the rise in the price of land, there would be a demand in that locality at a price nearing Rs. 35 or 50 ?

A.—Yes, because you can during the period of thirty years. Since 1910, 1912 the market price has been rising considerably. Leave aside the boom time. Since 1919 there has been an intrinsic rise. It cannot be ignored. Even now we are not below the level of 1918.

Q.—Do you take 1918 price as normal conditions ?

A.—I should say so.

Q.—You have said something about the Hornby-Ballard Scheme. When that area is opened for business purposes there will not be any demand in the reclaimed area for business purposes?

A.—But they don't want to sell at less than Rs. 300.

Q.—Do you know what the Municipality has paid for acquisition ?

A.—I think it may be Rs. 200 for residential area.

Q.—To be converted into business area ?

A.—Yes.

Q.—You have stated that the whole of this reclaimed area would realise about 8,80,00,000. Are you aware that about 5,90,00,000 have been spent ?

A.—I read that in papers. But I cannot say.

Q.—Supposing it costs you another 5 crores, the cost will come to 11 crores. This has not taken into account the interest for thirty years to come.

A.—The fallacy lies there. The Rs. 40 rate is spread over 30 years. The question will be what will be the cost on the day of completion when you put the land in the market for selling.

Q.—But you don't take interest into account ?

A.—That is already reflected in my rate allowing interest at 4 per cent. I take Rs. 40 to be a fair rate on the day of the completion of the scheme. We have spent so much as 5 or 6 crores whatever it be. The main point is, what is to be done in the future. We have got to spend a certain amount in the future and this 8 crores ought to be set aside against it.

Q.—Mr. Kanga, I will ask you a general question : Whether you would prefer to complete the scheme as and when there is demand for land or would you prefer to complete the whole scheme ?

A.—That depends on the advice you get from the constructional Engineer. Are you prepared to put these plots in the market as the scheme is completed in sections or are you prepared to wait till the time you complete the whole thing ? If it is cheaper to do the plots in sections and dispose them of, you had better do that for a certain time. In any case, the sea wall will have to be completed.

Sir Frederick Hopkinson.—Otherwise all the sea wall already built will be money thrown away.

A.—That is what I say. Now the question is what amount we have to spend now. By spending 5 crores if you can finish the scheme in five or six years, if you get that 8 crores you will be able to reduce the loss.

Sir M. Visvesvaraya.—If the scheme costs four or five crores only ?

A.—I think you ought to proceed.

Sir Frederick Hopkinson.—You remember that the scheme was first launched in 1919. Have you any recollection considering the value of the scheme ?

A.—I was reading the scheme in papers. At that time it appeared to me that there was no necessity for the scheme, as there was land available then.

Q.—Assuming that the scheme could be completed something under four crores, at that time it would be a profitable scheme for the Government to undertake ?

A.—Certainly.

Q.—Notwithstanding your objection it was a wise thing of the Government to undertake to work on that basis ?

A.—Four crores, yes.

Q.—At that time you would not consider Rs. 40 a low price ?

A.—Everything was rosy at that time.

Q.—In 1919-20, at the boom time, land would be much more than Rs. 40 ?

A.—But the question is how long the high prices were going to rule. How long they will take to complete the scheme. The conditions of the market were not known then.

Q.—You have already told us that in 1919 it would be a profitable undertaking ?

A.—If the scheme was ready at the time.

Sir Frederick Hopkinson.—I said when the scheme was first launched in 1919 would not you consider it profitable. Your answer was that at the time you considered it would be profitable if undertaken by Government and if it was only going to cost four crores.

23rd Witness

Mr. C. N. Wadia

Written Statement of Mr. C. N. Wadia

The most amazing thing about the Back Bay Reclamation Committee is that it should have been necessary. Here we have a qualified firm of engineers of world-wide fame tripping up in an amateurish manner which one would think a tyro would have been exempt from and a Government with a well organized cadre of engineers ignoring all ordinary precautions and business methods long and successfully pursued by their predecessors.

For if a reputable and capable firm of engineers are asked to advise on a vast engineering project one would imagine that they would have at least taken the necessary precautions to be certain beyond cavil of the foundations on which their proposals were based. Instead of which we find that the engineers of the project

(1) Never took any trouble to convince themselves of the quantity and extent of the mud, silt or clay they so airily decided to garner and use.

(2) With equal light-heartedness they ordered a dredger at a vast sum.

(A) Months before it was required.

(B) To pump material of the nature of which they had a limited knowledge.

(C) Worked it with engineers who had little or no knowledge of dredging methods.

(D) Failed to call in experts from the makers as soon as their machine failed to work up to specification

And a Government

(A) whose slogan seems to have been hurry, hush and more hurry,

(B) whose inability to consult the Port Trust as to the feasibility of the proposals was pitiful,

(C) whose ignoring of the rights of Bombay citizens to participate in the management of their own affairs was unfortunate,

(D) whose conduct in keeping the public in the dark as to the financial failure about to occur until the day such knowledge could not be averted was entirely reprehensible.

So much for the past and now for the future

One must realise that

(1) No less than 3 crores of rupees have been spent beyond recovery.

(2) That 25/30 per cent. of this vast sum represents dredgers, pipes and machinery whose value is little more than scrap to-day.

(3) That plots 1 and 8 are nearing completion.

(4) That only 1,800 feet of sea-wall remains to be built.

In order to make the best of this very bad bargain I suggest

(1) That plot 8 should be completed with the utmost despatch and handed over to the Government of India so that the interest charges are immediately extinguished.

(2) That plots 1, 2, 7 be completed by the dredgers worked as efficiently as possible by competent engineers.

(3) That the sea-wall under water be completed but so that the ebb and flow are unimpeded.

(4) That the remaining of the project be left in abeyance until further experience has been gained and the financial situation eased when it can be fully and fairly reconsidered.

Personally I do not agree with the proposal of an ornamental lake and a marine drive suggested by some people. Nor do I think that further reclamation will be undertaken in the next 25 years.

Sir M. Visvesvaraya.—You say in your statement " A Government with a well organized cadre of engineers ignoring all ordinary precautions and business methods long and successfully pursued by their predecessors ". Do you refer to the Public Works Department ?

A.—I refer to the procedure generally. Whenever Government in the past has carried out a work of this magnitude they have first of all invited the light of public opinion fully, fairly and at length. When they have had that public opinion they have considered these various opinions tendered to them and then they have estimated the cost and put the work out to tender. Instead of this, the Government conceived a scheme, they bottled it up and so we knew nothing about it until they were driven to disclose it in Council.

Q.—In your note you refer to a well organised cadre of engineers, you mean the Public Works Department ?

A.—Yes.

Q.—Are you aware that the work is being carried out by a special staff and not by the Public Works Department.

A.—I am aware of that.

Q.—Was that desirable in your opinion ?

A.—I think it was very undersirable to bring a lot of strange engineers on to a job, the nature of which, they were not well acquainted with. They brought Sir Lawless Hepper who is not acquainted with reclamation but he was a Royal Engineer.

Q.—But the local men have not got experience, is it not ?

A.—But still they have had more experience. I think our Port Trust Engineers had a lot of experience about reclamation.

Q.—They did not belong to the cadre of the Public Works Department ?

A.—I do not know if they would have a special knowledge of reclamation but I do think that there were men on the spot who knew more on the subject than the men subsequently employed on it.

Q.—You think that it was not advisable to supersede the Public Works Department ?

A.—Not by a worse organisation.

Q.—Here in another place you say the engineers of the project " failed to call in experts from the makers as soon as their machine failed to work up to specification ". Will you kindly explain ?

A.—I have something to do with machinery myself. When we want a new machine to do a new work, we send both the work and the product from which it is to be made to the makers. We are very particular about sending full details of what we want. If we want to spin waste we send waste to England to be spun into the sort of yarn we like. It is a trifling matter. We think, therefore, that an engineer who was about to spend 5 million pounds would at least have made sure about the ground work on which he was going to build his project. The first thing he should be sure of is whether there was plenty of silt, clay or mud in the harbour to dredge. He made no attempt to be sure of this.

Q.—Is it not usual to obtain guarantee from the makers ?

A.—If the dredger did not work up to the mark, he should have called the makers experts out here and asked them what should be done. Here is mud, silt and clay that you wish to dredge from one place to another, how should that be done. The fact of an engineer ordering a dredger to do work while he himself did not know what work it was called upon to do, is a piece of ignorance which I cannot forgive.

Q.—Everybody says that it is due to the clay being hard ?

A.—If that is what everybody says, it was the duty of the engineer connected with the dredger within six months to have got experts who could cut hard clay effectually. Surely there are men in this world with experience who are used to cutting hard clay.

Q.—You advise they should be called in for the future work ?

A.—I say no time ought to be lost in calling them in.

Q.—You say " the slogan seems to have been hurry, hush and more hurry ". Could you kindly give us some instances ?

A.—The first instance is that they did not take the trouble to ascertain the bottom of the harbour what they were going to pump. That is a most glaring instance.

Q.—That is a case of hurry ?

A.—That is knowledge coming after the event. The second instance of hurry is the ordering of the dredger without knowing what they were going to dredge. They must have imagined what they were going to do with it. The third case is that the dredger arrived 21 months before its time and therefore you lost interest on £750,000.

Q.—And the instance of hush ?

A.—Nobody knew anything about this project. It was conceived between Sir George Buchanan and Sir George Lloyd, and it was not made public until long after the dredger was ordered. We in Council have asked for the specification of the dredger but have not been able to get it up to this day and we have been told that the Secretary of State for India ordered this dredger and not the Government of Bombay. Shall I say if the Bombay Government is carrying out a project why the Secretary of State should have anything to do with it and order a dredger without the consent of the Government of India and the Bombay Government.

Q.—Any more instances of hush ?

A.—We have not been able to get any details out of Government and we were being assured up to February 1925 that all was rosy, that everything in connection with the building of the wall was below the estimated cost, that pumping and dredged filling was going on in perfect order. This was said by Sir Lawless Hepper in Council not so long ago as February 1925. In 3 or 4 months, the whole scene changes. Do not you think this is a policy of hurry and hush.

Q.—You were not correctly informed of the progress of events ?

A.—We were informed of nothing. Then the principal point I desire to mention is that when a project of this magnitude like the Improvement Trust or the Port Trust or any large work of that kind is formulated, we citizens of Bombay are asked to go into it and be responsible for the expenditure of it. We were asked nothing.

Q.—But you were not consulted for the money part of it ?

A.—Money part is probably only part of it. The Government ought to have come to us and said that we are going to spend so much. The Director of Development ought to be in charge of a Committee like the Improvement Trust or the Port Trust.

Q.—In future you would like to have a Committee like the Improvement Trust or the Port Trust in charge of the entire executive works ?

A.—Yes. The Chief Engineer ought to be a servant of this Committee and not the master ?

Q.—The Chairman of the Port Trust is not the servant ?

A.—He is a servant of the Port Trust and the trustees are the masters of the Port Trust. He cannot spend money without asking the trustees, he cannot do anything without their consent.

Q.—Here you say " whose ignoring of the rights of Bombay citizens to participate in the management of their own affairs was unfortunate " ?

A.—That is what I have explained. I would like the whole project to be in charge of a Committee of citizens of Bombay and I would like the citizens to decide what shall and what shall not be done in terms of the recommendations they receive ?

Q.—But that money belongs to the general taxpayers and not to the Bombay citizens.

A.—A very large share comes from the Bombay city.

Q.—It is a provincial charge ?

A.—They contribute the largest share to the revenues of the Bombay Presidency.

Q.—What would be the relations of the future Committee that you recommend with the Government ?

A.—The same as those of the Port Trust.

Q.—You think the execution of the work would be satisfactory ?

A.—I think so.

Q.—You say " No less than 6 crores of rupees have been spent beyond recovery ". The latest estimate of the Development Directorate is 4 crores out of which 2 crores would be paid by the Government of India for the land. I only wanted to draw your attention to it.

A.—Yes.

Q.—If the filling can be done by moorum earlier although not just as cheap as dredged filling would you prefer to fill by moorum ?

A.—If moorum filling can be done reasonably cheaper and within a reasonable measure of silt and harbour dredging, I would prefer moorum filling but I very much doubt whether it can be done within 33 to 50 per cent. of silt from the harbour.

Q.—What do you recommend about the future work, should we leave it where it is, or leave it half done ?

A.—You must complete No. 1 because you are getting money for it. No. 7 is the least expensive and can be done most easily, therefore I would certainly do it and I think I would complete 2 also.

Q.—Would you not give some sort of finish in order that it may not prove an eye-sore ?

A.—I would like to finish it but I do not understand the engineering difficulties. I cannot make up my mind about the sea wall to remain open and the monsoon waves breaking in and damage it.

Q.—If you complete the wall, you would not get in debris ?

A.—Yes, you will have to keep the gap open otherwise you would not get in debris. Monsoon helps in filling but if you complete the wall you will lose valuable material. I am not certain but Sir Frederick Hopkinson will be able to tell us. Perhaps an opening will be better in very severe monsoon because the waves can get through instead of dashing against the wall and damaging it. That is an engineering question but at any rate you have to get some substantial insurance against any future disaster.

Q.—You tell us the whole should be finished properly ?

A.—It is subject to what I have said that it ought to be determined by the Engineers whether debris coming in with the monsoon waves sufficiently compensate for the eye-sore.

Sir Frederick Hopkinson.—You were in Bombay in 1919 ?

A.—Yes.

Q.—Did you know the first inception of the scheme then ?

A.—I was able to see it afterwards but I never heard about its inception in 1919.

Q.—When did you learn that the scheme was to be proceeded with ?

A.—I think it was either at the end of 1920 or in the beginning of 1921.

Q.—I thought news travels quickly in the East ?

A.—I was away from Bombay a good deal in 1920.

Q.—When you heard of it, did you raise any objection ?

A.—No. I thought we are going to recover a very large area for the sum of 367 lacs. Looking at it casually, I thought it was an immense bargain.

Q.—And consequently you would have been delighted if the work had been finished for 367 lacs because it was going to be such an immense bargain for Bombay ?

A.—Quite so.

Q.—Therefore your objection to the scheme is that it is going to cost more than it was anticipated ?

A.—Very much more.

Q.—But then it does not affect the desirability of the scheme as a scheme. You think it is a good scheme if done at a price that will give you immense profit ?

A.—I cannot agree with you. If the scheme when finished is going to bring relief to the taxation of the Presidency, I say it is a very good scheme, but if this scheme, in the end, instead of being of benefit, is of great loss to the Presidency, I say that scheme had not been gone into carefully originally and ought never to have been incepted.

Q.—But you would have been glad to have a profit which would have been made had it been carried out at the original price and you feel disappointed if you are losing this immense bargain ?

A.—Yes, instead of its being of benefit, we would have been required to pay from our pocket for it.

Q.—When did you first change your mind about its not being a profitable scheme ?

A.—When the revised estimate came out.

Q.—That was September 1921 ?

A.—Yes, when the estimate of 702 lakhs came out I began to think that a project that could double in the course of a year had something very doubtful behind it.

Q.—You spoke about debris coming in with monsoon. Do you know as a fact that such debris does come in ?

A.—I know that debris does come in but to what extent, I cannot tell you. It may be very small probably 20 per cent., but I do not know it for certain.

Q.—If as you say it is 20 per cent., Back Bay would have been filled up many years ago. If debris come in 20 per cent. you would see the ground rising every season. Have you noticed any such change on the foreshore ?

A.—I had noticed some change in the past years but as you say if it was 20 per cent. it would be visible very soon.

Q.—Now with regard to your written statement ; I have very little to ask you on it, but if I may say so without offence, it looks to me very much like notes for a public speech than something that is going to help us in this enquiry.

A.—You may take it as you like but as the Committee asked me to give them written notes on which I was going to give evidence, I have given you notes. You may ask me any question you like.

Q.—I am quite sure that any orator on these notes could go on speaking for quite a long time. Of course the majority of those notes you have given us are subjects on which we have to give an opinion and do not seem to me to contain any facts on which we could form an opinion. These are all general statements.

A.—Not being connected with the project I am hardly in a position to give you those facts which are necessary for the formation of your opinion.

Q.—In item No. 3 (on page 2) of your written statement you say " that the sea wall under water be completed but so, that the ebb and flow are unimpeded ". Of course if you do that you will keep out all the debris you have been expecting to get in ?

A.—I would build it within five or six feet of low tide.

Q.—Debris travels along the surface of the sea wave. It is sand that comes in but that will not float. You get a little dirty water floating but not sand which will form a foreshore for you. You do not agree with the suggestion, I notice, that some one has made for an ornamental lake and a marine drive ?

A.—No.

Q.—It will be part of the final work ?

A.—Yes.

Q.—Anything you did in the nature of a marine drive would be part of the present scheme. It would not be something new ?

A.—Yes.

Q.—Probably the suggestion is put forward so that you should not have this eye-sore every time you come down to the sea front, and would you not personally see an ornamental lake rather than the back of that wall ?

A.—I would like to know how much that ornamental lake is likely to cost and who is going to construct it. I would prefer to see that at a certain cost, but not at something enormous.

Mr. Billimoria.—Mr. Wadia, your note is very illuminating and interesting. The facts that have been stated there have more or less turned out to be true. But I may be permitted to ask a few general questions if you do not mind. You have been a Member of the Legislative Council as well as the City of Bombay Improvement Trust for some years ?

A.—Of the Legislative Council for five or six years at least, but on the Improvement Trust I was only put on last year.

Q.—You are a millowner and familiar with the conditions of life of the citizens in Bombay. You must be aware, Mr. Wadia, that nearly 90 lakhs of square yards of land are now vacant and available in the town and island of Bombay.

A.—I am aware of that, yes.

Q.—Did you think that there would be a demand for 22 lakhs of square yards of the reclamation area in view of 90 lakhs being already available, did you think there would be an immediate demand for another 22 lakhs of square yards of land ?

A.—I am afraid I never thought about it. I thought the project was so beautiful and we were going to get something which was going to bring us back money in our investment in Back Bay a hundred-fold. I did not think the Government could possibly make so large an error, and therefore I did not literally think about the land part of it.

Q.—You were tempted with the profits of 30 to 50 crores "upon a modest estimate" ?

A.—I was impressed by it.

Q.—At the time the scheme was launched do you think there was a necessity for a scheme of that nature ?

A.—I do not think so.

Q.—Do you think the scheme has a reasonable prospect of being a productive one to-day by completing it ?

A.—Not a dog's chance I should say.

Q.—On a review of all the circumstances at present known and the future as far as it is possible to forecast it should the scheme be abandoned or completed in part or completed in its entirety ? You have put forward some suggestions. You have stated that plot 8 should be completed, 1, 2 and 7 should be completed and that the remainder of the project be left in abeyance until further experience has been gained and financial situation eased. Of course you confirm that opinion now.

A.—Entirely.

Q.—Would you as a prudent business man recommend to proceed very carefully and slowly or would you proceed to complete the scheme immediately ?

A.—I would be very cautious about how I proceed with the scheme.

Q.—With regard to the dredging plant that was ordered out, is it not usual, I suppose it is your experience as a machinist that when a new type of machine altogether unknown is ordered out the indenter does not pay the full value, but retains a certain percentage, 20 or 25 ?

A.—If there is a guarantee that the machine does something then it is the duty of the man paying to keep back the money. We are putting up a wireless station at a certain place where we are retaining for a year a certain amount of the contract price to see if it satisfactorily functions.

Q.—In this particular instance, although the dredgers were got to turn out a certain specified quantity there was no guarantee taken nor money withheld. Do you think it was wise or prudent ?

A.—Most unbusinesslike.

Q.—When you suggest that the scheme was launched by Sir George Buchanan and Sir George Lloyd, do you mean to suggest that no other Engineer was consulted by Government as far as you know ?

A.—As far as I know, I have not heard of any other.

Q.—If any one has suggested that the Secretary of State ordered out the dredger, I might say from the correspondence it appears it was at the instance of the Government through the Secretary of State which is the usual channel it was bought and that the Secretary of State did nothing behind the back of the Government of Bombay or the Government of India.

A.—We were told in the Council the Government of Bombay did not order the dredger, nor did they know the dredger was ordered until the Secretary of State placed the order for the dredger. They told us so.

Q.—That is an incorrect statement, Mr. Wadia, because the correspondence will show that.

A.—That was what we were told last year in February 1925 or 1926 in Mr. Cowasji Jehangir's speech. I think you will find it there.

Sir Frederick Hopkinson.—I think we ought to have that. Have you got the February speech ? Could you spot that from the proceedings in the Council if the book was handed to you ? I suppose it is difficult for you to do it now.

A.—After you have done with me I shall stay behind and look.

Q.—In the speech you made in the Council in March last session you have pointed out to Government the three mistakes Government had committed, and you say that you would apportion the blame where blame is due and guard against the repetition of follies and mistakes previously committed. Have you any particular idea as to where the blame is due, could you suggest anything, could you lay the blame at any one's door ?

A.—With all due deference to Sir Frederick Hopkinson my notes make it clear where the blame lay. I want to leave it to this Committee to apportion the blame. I know where it is due.

Q.—You say where the blame is due. This Committee would be guided by it.

A.—I think the blame attaches to the Engineer who ordered the dredger without knowing what it was to do and secondly to the Engineer who calculated it would cost 367 lakhs to do a job which would cost 11 crores.

Q.—Then, Mr. Wadia, in your speech you say, " I should not go on with the departmental work as it is at present worked ". Do you suggest any change in the method of work ?

A.—Yes. What I had in mind was the Citizens' Committee that I speak of should be created and it should be left to the Citizens' Committee whether they would carry on the work departmentally, and if so on what expenditure or whether they would ask for tenders from contractors. I am myself in favour of contractors.

Q.—To a contractor working under a Committee ?

A.—Yes. Quite easily. The general Engineer-in-Charge of your Committee would ask for tenders. He would say, " I can do the work departmentally for so much and the contractors' tenders are so much. Which would you like ? " And the work may be split up into sections. I presume you would have a capable Engineer who knows his business.

Q.—Then, Mr. Wadia, you say, " The appeal should be world-wide,—not only to local contractors—so that the best brains and men of ripe experience may be at our disposal in order to have large areas of land at our doors. " You still are of the same opinion ?

A.—Yes.

Q.—Do you think that if contractors from outside with very mature experience were invited by the Government of Bombay for carrying on this project it would not invite unfavourable criticism from people in Bombay ?

A.—No, not if they were shown what they were going to do. But the public want to be let into Government confidence. If Government take them into their confidence, however unfavourable a given scheme may be, the Government may rely on them. But the public are not going to back a project that is conceived in the dark and carried without any light whatsoever.

Q.—That is plain speaking, Mr. Wadia. Then you go on to say, " There will then remain, Sir, the financial burden, a veritable nightmare. I admit ; but Sir, there it is and I fear there is no cure ; we have got to bear it philosophically. " Would you in view of that suggest that the scheme may be carried on partially, as you have suggested in your note ?

A.—Yes, that is precisely what I mean.

Q.—With regard to the new constitution that you have suggested, would you suggest the Government Department to carry on the work with the Advisory Committee, or would you transfer it over to the Public Works Department and the Advisory Committee working it ? Do you want the present Department to be abolished or to carry it on with the Advisory Committee as an executive body ?

A.—I should create the Advisory Committee first and let them decide what they will do, either the Government or private agency. Let them decide. If they are going to trust the Citizens of Bombay let them trust wholeheartedly.

Q.—In your note, Mr. Wadia, you have stated with regard to Government that their conduct in keeping the public in the dark as to the financial failure about to occur until the day such knowledge could not be averted was entirely reprehensible. Do you blame thereby the Government or any particular official of Government ?

A.—Everybody concerned with it. I think the public have a right to know of their misfortunes as well as their good fortunes at the earliest possible moment, and not deferred until they could not be hidden any longer. But it is for you, gentlemen, to determine who the culprits are. I am afraid I do not know who they are.

Q.—Do you suggest the facts were not known to the public and were kept back until the Advisory Committee's Report was published ?

A.—It looks very likely.

Sir M. Visvesvaraya.—The total area to be reclaimed is fifty-five lakhs of square yards. Out of these fifteen have been completed or will soon be. Forty lakhs of square yards are left to be done. Assume it will cost about Rs. 10 per square yard to complete those 40 lakhs of square yards. That will be about 400 lakhs. If that money is spent the whole work may be completed. That is my view. Probably my colleagues do not share that view. The work will be completed if 4 crores are spent even by moorum filling. You do not want any scientific machinery or plant for that purpose. On the other hand about 22 lakhs of square yards will be made available for building area. And 22 lakhs of square yards at Rs. 40 will give you 8·80 crores of rupees. Rs. 40 per square yard was the amount suggested by one of the estate agents who came before us to-day. It will be fair when you start building to assume a rate of Rs. 40 per square yard. On the one side you have got an expenditure of 4 crores to incur, and on the other a prospect of getting 8·80 crores return. If the conditions are as I have stated, would you complete the work or would you hesitate ?

A.—We will take your figure of 4 crores. How long did your estate agent tell you it would take for the people of Bombay to absorb this 22 lakhs.

(*Sir M. Visvesvaraya.*—He said thirty years. So that your 4 crores may go into 15 crores by way of interest.)

Q.—He said at the start you may assume a rate of Rs. 40 per square yard after making allowance for the interest and other charges. By calculation it would be fair considering the current rates at which land is sold to assume a rate of Rs. 40 per square yard. What he said was you could take Rs. 40 when the land was ready for sale, that being the price it was worth at that time after allowing for sinking fund. The value of the land when it was ready would be Rs. 40 a square yard after allowing for sinking fund.

A.—I do not follow his argument.

Q.—You see it is going to cost you in the next four or five or six years four more crores to complete the scheme. But whatever you spend you disregard, but you take this 4 crores.

A.—Those 4 crores will not mature until the last plot is sold.

Q.—Probably he expects the rate of Rs. 40 to be the current rate while starting the building or at the time the work is completed and the building is commenced.

A.—Looking at the past history of Bombay such as I know it, I may be wrong, it would be very difficult to absorb 22 lakhs of yards in thirty years. It would be almost an impossibility. That is my own opinion. But we are all making guesses. But that is what I should say. It is very difficult to have that land absorbed in that time.

24th Witness

Mr. J. P. Mistri, Architect, Member of Mr. Neilson's Committee

Sir M. Visvesvaraya.—Your full name please ?

A.—Jamshedji Pestonji Mistri.

Q.—You were a member of Mr. Neilson's Committee ?

A.—Yes, I was.

Q.—Can you tell me generally what was the result of your investigation on the Committee ? What conclusions did you come to generally ?

A.—We came to certain figures of valuation. We examined minutely all the figures that were given by the Development Directorate and then we took out our own figures and with that we corrected their estimate and sent the report.

Q.—Do you happen to remember the figures ?

A.—No, but I have got a copy of the Report.

Q.—Have you made any comparison of the rates between dry filling and moorum filling ?

A.—Yes, I think the rate is given there. In block 8 it comes to about annas 11 I think for dredging, and moorum filling comes to about Rs. 1·57.

Q.—What were the figures originally given to you ?

A.—I do not remember them.

Q.—Have you read the specifications for dredgers ?

A.—No.

Q.—Whom do you usually hold responsible for the proper working of a plant like this ?

A.—Those who undertake to look after it.

Q.—Usually is it the engineers or is it the officers in charge of the work or the makers ?

A.—I think all combined together.

Q.—You would mention that in the specification ?

A.—Certainly I would have a guarantee from the makers that the dredger would give the required output on the spot.

Q.—If that has not been done it was an omission ?

A.—Yes. As a matter of fact we asked the dredging master whether any experiment was taken with the dredger before charge was taken. He said the experiment was taken in the river but without any pipe line, and we asked about the nature of the silt, and he said it was very soft. So if the trial was taken under such conditions it was no trial at all. It was not the condition in which it was required to do work.

Q.—You know the Kandivli quarry ?

A.—Yes.

Q.—The quarry was taken in hand in order to get stone for the sea wall ?

A.—Yes.

Q.—They are getting some moorum now from there ?

A.—Yes.

Q.—Do you not think that moorum and soil and material for filling can be got from areas nearer than Kandivli either in the G. I. P. Railway or the B. B. & C. I. Railway ?

A.—I think we could get.

Q.—It is not necessary to get moorum only. You might get stone and other murum ?

A.—Yes, it is better to get both.

Q.—You think you could get moorum or soil nearer than Kandivli which is eighteen miles ?

A.—I think so.

Q.—And you can get moorum from Kalyan side *via* Dadar ?

A.—Yes.

Q.—Have you calculated the cost of bringing moorum by barges ?

A.—No.

Q.—By lorries ?

A.—I know contract has been given per brass for Rs. 2-8-0. The Municipality is going to pull down a large number of houses in Hornby Road and Ballard Estate shortly and a larger quantity of debris for filling in will be got from there.

Q.—You know the railway charge is four annas for transport from Kandivli to here. What I want to ask you is if you are likely to get stone and moorum nearer would not the rate be lower ?

A.—Yes.

Q.—If you increase the quantity brought in daily ?

A.—I do not know how the freight would decrease, because it would be settled railway charges.

Q.—For both reasons you think you might be able to get it cheaper than this ?

A.—Yes.

Q.—Do you happen to know the rate for moorum delivered at the rail head ?

A.—No, not that way. When I was in the Committee in order to satisfy myself whether the rate was correct or not I made inquiries through good contractors, independently if they took the contract what rates they would charge. They gave me a rate very much near this figure, 5·79 per brass. And I think when they are going to give tenders they are going to quote that rate. If I give out their exact figure, it will become an open secret to other contractors.

Q.—You get moorum for 5·79 per brass ?

A.—Yes.

Q.—Is that consolidated at site ?

A.—No, delivered at site.

Q.—You went over the works ?

A.—Yes.

Q.—Have you any opinion as to the future conduct of the works ?

A.—We have said in our reports that No. 7 may be taken in hand, and No. 1 may be completed and after these are completed, after actual experience, further progress should be considered. But it will take a number of years to complete it.

Q.—For moorum you know the depth of filling on an average is about five yards.

A.—I know about four yards.

Q.—Four yards in some blocks. On the whole it is five yards. The maximum is 5·5 yards. That being so, if you apply your rate of 5·79 per brass, the quantity per square yard will be how much ?

A.—1·35 multiplied by 5·79=about 8·69 or about Rs. 8 as. 11.

Q.—If it costs you Rs. 8 as. 11 to complete one square yard, do you think it is a business proposition to complete the work ?

A.—Certainly, I think so.

Q.—Have you noticed the quality of the material available for dredging ?

A.—Yes, I have seen it.

Q.—What do you think of it ?

A.—I think it is very soft. I went myself for checking the quantities and levels. I went to check the levels in block No. 1 and No. 8 at the requst of the Chairman.

Q.—You also made experiments for shrinkage ?

A.—As I went to check the levels I found there was a difference of two feet in the levels. It had gone down. It had gone down from the original level which they took. Then I sent a man inside about thirty or forty feet. He was then half in the mud. I asked him to go further

and he said it was impossible. In Colaba on the very edge he could not go in. It was so very soft, that a man would be drowned and I was told that two men trying to catch fish there got drowned. So by way of experiment I put in my staff and the staff went simply with the pressure of the hand seven feet inside. That struck me that the percentage of fifteen given by the Development Directorate was not enough. I asked the Assistant Engineer to give me a tin. He brought one tin. I filled it with the material. There was a lot of water over it. I put out the water and carried it home. I began to think how to experiment. I thought any vessel would not do. I took an earthen pot, because I thought the percolation would expedite the experiment. On the very first day within twenty-four hours it went down $1\frac{1}{2}''$. The cubic contents was 242·59 cubic inches and what was lost was 75·69. That gave me 31 per cent. of shrinkage. I showed it the next day to the Committee, and I allowed it to stand for eight days and at the next meeting it went $2\frac{1}{4}''$ below and there were cuts everywhere. So that gave us 107·14″ shrinkage, and that was about 49 per cent. The Committee went to the plots again and in looking at them the Chairman pointed out that although there was 49 per cent. at the top there would not be so much shrinkage at the bottom, because the bottom would be rather settled. So after great discussion we came to the conclusion that 40 per cent. would be a proper shrinkage to allow.

Q.—In what order do you propose to complete the blocks ?

A.—Seven and one.

Q.—You have not thought of No. 2 ?

A.—That should be taken up after completing the first block.

Q.—As an engineer what is your view about the completion of the work ?

A.—You mean which should be completed first ?

Q.—You want to complete these three and leave the works ?

A.—I do not want to leave the works, but only to proceed cautiously. If you go slowly, you can sell what you have completed.

Q.—The whole of the foreshore will be in an insanitary condition and it might be prejudicial to the health and business interests of the population ?

A.—If sead water is allowed to come in and go out as it does now, I do not think it will be.

Q.—Have you examined the estimates for reclamation of the Development Directorate ?

A.—Yes.

Q.—What is your opinion about the individual items ? Are they reasonable or are any of them excessive or insufficient ?

A.—They have not taken into account the over-head charges which forms a very great item. We had to go to the auditor to ascertain these. Then the shrinkage was given less. There were some mistakes in calculation and those mistakes were corrected.

Q.—I want to put you one more question. You know that the total quantity of filling for the reclamation is 28 million cubic yards ?

A.—I do not remember these figures.

Q.—You have got the ferro print ? That gives the figure.

A.—I see.

Q.—You say that the cost of moorum filling would be about Rs. 1-8 or less. Is it not ?

A.—Yes.

Q.—Then the cost of 28 million cubic yards at Rs. 1-8 would be 420 lakhs ?

A.—Yes.

Q.—Adding to this 80 lakhs an approximate cost of the sea wall and another 50 for other contingencies like the quarry and so on, you get a total of Rs. 550 lakhs for which this reclamation could be completed without any dredgers at all ?

A.—Yes.

Q.—If the work could have been completed for $5\frac{1}{2}$ crores, Government should never have gone for an estimate of 702 lakhs. Is it not so ?

A.—That depends upon how fast the work of moorum can be done.

Q.—Do you expect any difficulty in doing the work fast enough ? Can you not get moorum from both sides, from both railways ?

A.—How many trains could come every day ?

Q.—Can you not have trains at night time ?

A.—This requires investigation.

Q.—If after the investigation you think that by moorum filling you can complete the work in three or four years, it is worth doing ?

A.—Of course.

Q.—The whole data requires investigation ?

A.—Yes.

Sir Frederick Hopkinson.—You give a price of 5·79 per brass for moorum. Can you tell me how you arrive at that ?

A.—The Development Directorate had given us certain figures. We asked the engineer about all those figures, and the committee after satisfying themselves over the working of these figures added for shrinkage and then arrived at these figures.

Q.—They accepted those figures ?

A.—They cross-examined the engineer.

Q.—What I want to know is how that figure is arrived at ?

A.—He has given something for royalty also.

Q.—I want the details.

A.—The details are here. We only added the shrinkage and accepted the figures. The details are :—

Excavation and loading	5·12	annas per cubic yard.
Quarry charges including acquisition and royalties	6·56	„ „
Freight to Bombay	4·48	„ „
Tipping and spreading	2·4	„ „
Loco roads, maintenance, etc.	2·72	„ „
The whole thing comes to	21·28 or 1·33 Rs.	

Q.—Does it cover the use of the locomotive ?

A.—No, only what they pay at the quarry.

Q.—Locomotive in the quarry, where is that charge ?

A.—It is included in excavation and loading.

This is the cost per ton in trucks. Multiplying this by 3·7 it will give you the price per brass.

Q.—What about shrinkage ?

A.—Fifteen per cent. should be added.

Q.—That brings us to Rs. 1·53, whereas we have taken the figure 1·57. The other thing I wanted to ask you was this. You were explaining the shrinkage. You say you took a cylinder ?

A.—First I took from the Colaba reclamation area a tin of the sample material. The tin was full and on the top was water.

Q.—Was it very soft ?

A.—Yes. I told the Assistant Engineer to bring one sample from the place. He sent one man and took it out. He brought it to me. There was a lot of water on the top. But I threw away the water as it would have spoiled my moter I threw away some mud from the top. After taking the tin home I thought that if it were put in a metal pot it would not evaporate fast as it would only do so at the top. If there was something from which the water would percolate, it would be better. So, I found an earthen pot with parallel sides and I put it inside this. There were seven inches of mud inside the vessel.

Q.—Was the vessel full ?

A.—No, something less from the top.

Q.—How much from the top ?

A.—About two or three inches from the top.

Q.—The material was two or three inches from the top and the mud was seven inches deep ?

A.—After twenty-four hours it sank down one and a half inches.

Q.—Did you state originally that it was two or three inches from the top ? Was this measure taken in the same way ?

A.—I took my measurement of sinking from the top line of the mud. All my measurements were from the top line of the mud. Seven inches was reduced by one and a half inches in twenty-four hours. Then the total contents of that mud was 214·76 cubic inches.

Q.—Was that before you took it ?

A.—No, this is just when it was put in, *i.e.*, before it sank. The portion that sank, one and a half inches, measured 75·40. Then after eight days it sank two and a quarter inches on the whole which measured 106·14 cubic inches, and it is nearly 49 per cent.

Q.—What was the first percentage of sinking ?

A.—35 per cent.

Sir Frederick Hopkinson.—That is all I want.

Mr. Billimoria—Mr. Mistry, did you rely on the figures submitted to you by the Development Department ?

A.—We examined the figures wherever we wanted and we also verified the figures personally from the Audit Department.

Q.—Did you work anything independently by your own tests ?

A.—We looked into the shrinkage and cubic contents.

Q.—In your report you say that you want moorum filling of one foot deep ?

A.—Yes.

Q.—In your experience of reclamation do you think one foot of moorum sufficient on a reclamation area ?

A.—If the moorum filling is done after the dredging has properly settled, it will be sufficient.

Q.—It sinks every day. Then you want a larger filling ?

A.—Yes.

Q.—One foot would not be sufficient ?

A.—If it is done while it is wet. We have taken samples of this mud and have experimented on it. We have found that it becomes as hard as stone if it is dried.

Q.—How long does it take to dry ?

A.—Two years.

Q.—For two years no moorum filling is to be put in ; the land is to be allowed to dry before moorum filling is put in ?

A.—Yes.

Q.—How long does it take to get dry ?

A.—I think about two years.

Q.—Do you mean to suggest that for two years moorum filling is not to be put in ?

A.—I think so.

Q.—And the land is left to dry and settle down for two years before any moorum is put in ?

A.—Yes. We wanted to put these remarks on record.

Q.—On this basis, if it is immediate filling you would require four to five feet ?

A.—I think six to seven feet.

Q.—Do you think there is sufficient quantity of moorum available in the vicinity of Bombay for filling for the whole area of reclamation ?

A.—I think so.

Q.—How long would it take ?

A.—That depends upon working a number of trains.

Q.—Roughly ?

A.—It may take about twenty to twenty-five years.

Q.—After having spent six crores on the scheme, and bringing in moorum filling running for twenty-five years, have you any idea, with interest piling up, what the eventual cost is going to be ?

A.—I cannot say.

Q.—It is going to be tremendous ?

A.—If the work is done in parts.

Q.—My friend Sir Visvesvaraya asked, when all things have to be done at the same time, whether it was a feasible proposition. I ask you as an engineer, if it takes twenty-five years to fill the whole block, do you think it is a business-like proposition ?

A.—I do not think.

Q.—With regard to the flow of tide, you think it will not be a danger to the health of the citizens of Bombay if water is allowed to flow on each tide and the work is not completed ?

A.—Yes.

Q.—The health of the citizens of Bombay will not in any way be affected ?

A.—I do not think.

Q.—While considering and calculating the cost of moorum you have not taken into account the extra cost that will be incurred for rolling stock and the bringing in of extra trains if you want to expedite the work. That cost, we have heard from other witnesses, would roughly run to forty or fifty lakhs of rupees. Do you think that amount should be added to the cost of the moorum ?

A.—In our committee we considered this question, and we thought that the only possible way would be to work it with all the materials and all the appliances that are available now and not to buy anything more, and not to calculate any interest on that. If any interest is calculated on all those appliances, then the scheme is impossible.

Q.—Taking interest into account, you think it is a hopeless failure ?

A.—Yes.

Q.—Therefore you would not launch into the whole scheme, but would go cautiously and slowly with your present recommendation of filling in or completing blocks 1, 7 and 2 ?

A.—Yes.

Q.—And after you have had some experience of blocks 1 and 7 you would advise the Government to fill in block 2 ?

A.—Yes.

Sir Frederick Hopkinson.—I am going to suggest to you that the 40 per cent. shrinkage you have given is not accurate, for this reason. The sample for taking the tests of shrinkage must all be taken near the wall of block 8. I suggest that this figure is quite wrong and does not fairly represent what may be expected. The pumping commences delivering the material at the edge of the foreshore, and the lighter particles run from there towards the back of the sea wall, the heavier particles remaining near to the pump outlet. This continues until the reclamation area is filled up to its highest level and therefore the point from which this sample was taken is a sample of all the lightest particles which have been pumped by the dredger and is not a fair representation of the filling of the block ?

A.—I do not quite agree to that.

Q.—The reason is obvious. The heavier particles settle down and the lighter particles run off the top. You would expect to find all the lighter particles on the top and near the wall ?

A.—Partly right. But my calculations gave me only 40 per cent. against 49 after 8 days' experiment only.

Q.—It might be more ?

A.—We don't take all the cracks into consideration.

Q.—When this is consolidated below the surface, there would be no cracks. Generally speaking, you would agree with me that it is not a fair representation of the material in the Back Bay ?

A.—No.

Sir M. Visvesvaraya.—Your experiment showed that there was a shrinkage of 50 per cent. and they took 40 per cent.

A.—The Committee adopted 40 per cent. after going through the whole again and considered that as the bottom part is already settled there would be no further shrinkage there. They took that into account.

The witness withdrew ; and the Committee rose for the day (5 p.m.)

The Back Bay Enquiry Committee assembled at 11 a.m. on the 19th August 1926 at the Legislative Council Committee Room, Civil Secretariat, Bombay, with Sir M. Visvesvaraya in the Chair, Sir Grimwood Mears being absent

25th Witness

Mr. E. M. Duggan, Under Secretary to the Government of Bombay, Public Works Department

Sir M. Visvesvaraya.—To-day also I have to announce that the witnesses and the public will miss Sir Grimwood Mears. He will probably be able to resume his duties on Saturday.

Q.—What is your Christian name?

A.—Edwin Merle.

Q.—Can you tell us to what extent the Public Works Department has participated in the Back Bay Reclamation Scheme from the commencement, as far as you know?

A.—So far as I know, Sir, the Public Works Department was the Government Department that dealt with the matter up to about the end of 1918 or early 1919.

Q.—The work has been going on in your Department for many years?

A.—Many and varied schemes have been prepared.

Q.—Were soundings and borings taken before Mr. Kidd took his?

A.—I don't think so.

Q.—In 1912.

A.—Not to my knowledge.

Q.—If I may suggest, Mr. Kemball was employed on this duty about 1904-06 when I was in the Secretariat. He was doing this work. Did he not take soundings?

A.—I think it is very probable that he took soundings in the Back Bay, but that was over the area to be reclaimed and along the line of the wall.

Q.—Do you happen to have his drawings?

A.—They were all transferred to the Development Department.

Q.—None of the sections are available now on your records?

A.—Not with us.

Q.—Can you tell us the names of the officers who have been associated with the scheme besides Mr. Kemball?

A.—Mr. Beale.

Q.—Mr. Cameron?

A.—Yes, and I think Major Johnston, to a certain extent. Major Johnston is a Royal Engineer Officer attached to the Public Works Department.

Q.—How many schemes were prepared before Mr. Kidd prepared his?

A.—I think the first serious one was made in about 1906, probably at the time of Mr. Kemball, and then I think one was made in 1911 largely, I think, on the data submitted by Messrs. Wolfe Barry & Co.

Q.—So, there were two estimates before Mr. Kidd prepared his?

A.—At least, I think.

Q.—Did Mr. Kidd base his drawings, plans, and estimates on any of the surveys conducted previously?

A.—So far as I know, all the available data was made available to Mr. Kidd. To what extent he utilised it I don't know.

Q.—You are not aware of any borings having been taken in the Harbour by the Public Works Officers?

A.—No. In fact, I am fairly sure that none were taken; I have been able to find no trace.

Q.—Have you as Under-Secretary seen Mr. Kidd's estimate and also that of Sir George Buchanan?

A.—Yes, I have read Sir George Buchanan's estimate as printed in the book.

Q.—You are also aware of the 367 lakhs estimate?

A.—Not in my official capacity.

Q.—You have also seen the sanctioned estimate for 702 lakhs?

A.—No.

Q.—Upon which the work is being carried on?

A.—I have not seen that.

Q.—You are not aware of the expenditure on the work?

A.—No.

Q.—You are not aware that the estimate was increased from 400 lakhs to 702 lakhs?

A.—I am aware of that; that is public property.

Q.—What was the increase of 75 per cent. due to? You may for the moment detach yourself from your position as an official?

A.—Well, one thing that I do know, Sir, is that Mr. Kidd's pre-war price of pump filling, speaking from memory, is 9 annas 3 pies per cubic yard and Sir George Buchanan's post-war estimate was eight annas.

Sir Frederick Hopkinson.—In each case do they include charges?

A.—Interest?

Q.—No, capital cost of the project?

A.—Presumably.

Q.—Mr. Kidd's was annas 9 and pies 3 per cubic yard and Sir George Buchanan did not make any estimate in 1912?

A.—This is Sir George Buchanan's estimate in 1919.

Q.—At any rate, Mr. Kidd's estimate was Rs. 0-9-3 in 1912 and Sir George Buchanan's estimate was 8 annas post-war?

A.—That is right.

Sir M. Visvesvaraya.—Have you read the recent reports of the Advisory Committee?

A.—Yes.

Q.—Have you seen the specifications for the dredgers in 1919?

A.—Only that which is given in Sir George Buchanan's report.

Q.—What do you think of the conditions put in in the contract for the supply of dredgers?

A.—I have not studied the contract. In fact, I have not seen it.

Q.—If the plant is designed to give a stipulated output, it is usual to obtain guarantees for the performance of that obligation. If the dredger is designed to give a certain output it is usual to have guarantees that it will come up to the stipulated capacity. Is it not?

A.—Yes.

Q.—That is the practice in the Public Works Department?

A.—Yes.

Q.—In connection with all engines and large plants? If such guarantee were omitted it would be a serious omission?

A.—Yes.

Q.—Have you any experience of the rates at which work is done in the Bombay City?

A.—Not exactly.

Q.—Do you know roughly?

A.—I see all the estimates that go through the Secretariat.

Q.—At what rate can moorum filling be done in a place like the Harbour, from your general knowledge of conditions here?

A.—I do not really know. It will entirely depend on the quantity.

Q.—Do you mean to say that the larger the quantity the smaller will be the rate?

A.—That is generally speaking true, provided that the stuff can be got.

Q.—I suppose you know the area north of Bombay, Salsette?

A.—Yes, to a certain extent.

Q.—You have seen the Kandivli quarry?

A.—Yes.

Q.—The Kandivli quarry has been selected to obtain stone. In order to get moorum it should be possible to select quarries nearer the work?

A.—Yes. It would be largely a question of the cost of acquisition, the value of the land that you are going to acquire for the purpose of the quarrying.

Q.—Probably they paid Rs. 1,000 per acre?

A.—At Kandivli.

Q.—North of Bandra?

A.—I don't know much about that.

Q.—If, at present, they are getting moorum at the rate of Rs. 1·57 per cubic yard when they are getting daily about 2,000 cubic yards, what would be the rate if the quantity were increased to 10,000 cubic yards?

A.—It depends on whether the excavation is being done in the most efficient manner. If not then I would anticipate a material decrease in the cost per unit if you increase the quantity; otherwise Re. 1½ will be a fair rate.

Q.—So, you take Re. 1·5 per cubic yard?

A.—Well, I think so. I have not practical knowledge of that.

Q.—Would there be any difficulty in the transport of such a large quantity, say, 10,000, instead of 2,000 cubic yards a day?

A.—That will depend on the railways.

Q.—It will give them more business, they will be glad to transport?

A.—Oh Yes, but it will be question as to whether they could handle it on their lines.

Q.—The G. I. P. Railway can pass through Dadar on to this line?

A.—Yes.

Q.—Now, when the scheme was taken up they created a separate department for its execution?

A.—Yes.

Q.—Could not the Public Works Department have carried out the work with the Chief Engineer at the head?

A.—I see no reason to doubt it, Sir. We are carrying out the Sukkur Barrage.

Q.—On the same lines you might carry this out?

A.—Not necessarily.

Q.—You mean on different lines?

A.—I take it you are speaking of the actual method of execution of work. The Lloyd Barrage is being executed departmentally.

Q.—It does not matter whether the work is done departmentally or by contract. You will have your own Engineers to supervise?

A.—Yes.

Q.—Would not the traditions of the department have prevented the mistakes made and keep the work on the right lines?

A.—You mean with regard to the organization?

Q.—You have got the necessary staff to attend to the details, to check estimates.....

A.—Yes.

Q.—But with a new department they have to create new traditions, organise a new accounts staff, train staff for checking estimates and so on?

A.—Yes, that is true.

Q.—Have you any other facts and figures that you can give us which will be useful for our purpose in connection with the scheme, now or in a day or two? We want facts and figures about the origin and conduct of the work.

A.—I have found a demi-official letter from Mr. Beale to Mr. Kidd, dated November 1914. In that letter Mr. Beale said that " I am arranging to find out the amount of stuff available for reclamation *from Back Bay*. I thought you had done this before, but I find from your Report that the question was quickly disposed of as you concluded there was not enough material for the big reclamation and you also stated that the exposed position would make it difficult to work except for a limited period of the year ". At that time they were considering a much smaller scheme—220 acres, and then there is a letter apparently in reply from Mr. Kidd to Mr. Beale, dated 31st December 1914, that is, a month later. He says, " You would gather from my recent report that I am not on the whole very sanguine about obtaining a sufficient quantity of material for the filling from Backbay under sufficiently favourable conditions to compensate the disadvantage of dredging and pumping sand as against mud and clay and for the difficulties and delays of carrying on dredging work in the exposed conditions and probably on the irregular bottom in the Bay. Obviously it was a hopeless course for the whole scheme, especially so as the situation of the 220 acres is the least favourable of any part of the total scheme in relation to the mud and clay deposit in the harbour ". Whether there was material available I do not know. I have been unable to trace any record.

Sir M. Visvesvaraya.—That information will be useful to us.

Mr. Billimoria.—Were Government aware of these opinions when the estimate was sanctioned at the time Sir George Buchanan's estimate was sanctioned?

A.—I do not know.

Sir M. Visvesvaraya.—As an Engineer, have you any ideas about completing the work? We have got blocks 1 and 8. They will be completed in any case.

Sir Frederick Hopkinson.—You can't say that till our report is made.

Sir M. Visvesvaraya.—But the Government are committing themselves. You know the difficulties. You have read the Advisory Committee's Report.

A.—I would make a list of all the plant, etc., publish them and ask for tenders for the completion of the work using the available plant.

Q.—Including the dredgers?

A.—Including them.

Q.—Would you place it into the hands of the Public Works Department or leave it to the present organisation?

A.—I would prefer not to express an opinion on that.

Q.—Are there any facts and figures you can give us to help us in our enquiry?
A.—I don't think so.

Q.—Is there any other officer in the Public Works Department who can give us any more information, and who understands the details of the project?
A.—Mr. Kemball and Mr. Beale are both dead.

Q.—Any one in England?
A.—Mr. W. L. Cameron, Mr. Dunn.

Q.—Any others?
A.—Mr. Rajadhyaksha.

Q.—Did he do any work?
A.—He may have done some survey work or something, I am not sure.

Sir Frederick Hopkinson.—Mr. Duggan, you used an expression just now that I am not familiar with. Could you explain to us what it means, that is, " demi-official "?
A.—Well, Sir, it is a letter written by a Government official as an individual to a gentleman by name as distinct from a letter to a man by the title of his office.

Q.—Is it the idea, therefore, that it carries no responsibility?
A.—Certainly not, but it does not carry the same responsibility.

Q.—Does it go on the files?
A.—That entirely depends on the discretion of the receiver.

Q.—Is it used as a means of getting out of any statement that is made in it?
A.—Oh no.

Q.—It may be taken as official then in some sense?
A.—It can certainly be taken as the opinion of the individual, but not as the opinion of the official.

Q.—It is beyond me, we will leave it at that. One point I wish to ask, how long have you been connected with the Public Works in the Bombay Presidency?
A.—Twenty-one years.

Q.—How long have you been in the Bombay City?
A.—Two years before the war and two years now.

Q.—Can you tell me approximately what was the percentage of the increase in prices between the years 1912 and 1919?
A.—For a fairly large engineering scheme?

Q.—For material, plant, labour
A.—I should say roughly 100 per cent.

Q.—Have you any data confirming that? Take labour, for instance. What was labour before the war as compared with what it was in 1919 in this District.
A.—I have not had executive experience in Bombay, but I should say that the pre-war rate was 8 annas.

Q.—What would it be in 1919?
A.—About 12 annas to a rupee.

Q.—That is from 50 to 100 per cent. increase. Tools
A.—I don't know.

Q.—Cement?
A.—I have forgotten what the pre-war price was. Post-war cement is manufactured in India, which was not so pre-war to the same extent.

Q.—I have seen some figures under which they paid Rs. 100 a ton?
A.—Yes.

Q.—Dropping down to 80 or 85. What had you to pay for cement before the war?
A.—I could not say.

Q.—Didn't you use cement before the war?
A.—Yes, but we didn't get any large quantity as our work was generally done by contract.

Q.—Would you be surprised to hear that the price of cement in 1912—1919 went up 3, 4 and even 5 times?
A.—I could believe that.

Q.—I am trying to check your 100 per cent. Cement is an important thing. Now, take the plant. Do you know the price of a 10-ton crane before the war? For your information I shall tell you that it was £450 to 500. After the war it was £1,700. That is an increase of 300 per cent. A good bucket dredger before the war cost £30,000 or 35,000. The post-war price was 3 times that. I am trying to show that your 100 per cent. is very low.
A.—I was referring to ordinary Public Works operations which were small.

Q.—Was any machinery required for those ordinary small works?

A.—I am speaking really from my experience of Poona. I was in charge of Poona Division in 1918.

Q.—The estimated cost for dredging according to Mr. Kidd's report in 1912 is annas 9 and pies 3 per cubic yard. Do you know of any circumstance that would enable that same work to be done after the war at 8 annnas per cubic yard?

A.—No, Sir.

Q.—Do you think it is possible to do work at a cheaper rate after the war than before the war?

A.—It depends on the method which was estimated for but I doubt it.

Q.—Doesn't it startle you to see these comparative estimates, doesn't it make you rub your eyes and say " it is misprint "?

A.—It does seem so now. But whether it would have done in 1919 I cannot say.

Mr. Billimoria.—Mr. Duggan, you have been in the Public Works Department for the past 21 years of which you have spent 4 years in Bombay and you will more or less be conversant with the conditions of affairs in Bombay with regard to labour and with regard to various projects that might have passed through your hands?

A.—I have been in Bombay but in the Secretariat as an administrative officer and not as an executive officer.

Q.—I see that you are a member of the Institute of Civil Engineers.

A.—Yes.

Q.—Did you actually study the report and the estimates of Sir George Buchanan? Did these ever come to you?

A.—No.

Q.—Do you know which was the officer in the Public Works Department that was consulted on those estimates.

A.—No.

Q.—Were those estimates ever checked by the Public Works Department Officers.

A.—I do not know. I was not in Bombay then.

Q.—Do you know if the Public Works Department was ever consulted by Government?

A.—I have no personal knowledge of that point.

Q.—As an Engineer of vast experience is it not usual to allow for some contingencies in estimates?

A.—Certainly.

Q.—If you will kindly turn to page 29 of the Report of Sir George Buchanan, do you find any contingencies provided there?

A.—Not there. It's possible it might be in the detailed estimates.

Q.—If you will now turn to page 30, you won't find allowance for contingencies there?

A.—No.

Q.—Is it not the usual practice where estimate of a large project is concerned to get the same checked by higher staff? Have you not personally checked these? If so, you are not in a position to say so?

A.—No.

Q.—Do you find any item in the estimate making provision for storm water drains?

A.—Yes.

Q.—Where is it please?

A.—It is in the Government P. W. D. estimate made in 1912 for roads and lighting and storm water drains, etc.

Q.—Have you any reason to suppose why this figure was doubled within such a short space of time?

A.—No.

Mr. Billimoria.—Since you have not gone through the details I would not trouble you any more? Do you know if Sir George Buchanan is still a Member of the Institute of Civil Engineers? (Question withdrawn).

Q.—In answer to Sir Frederick you explained that there is a practice of sending out D. Os. between officials and officials of Government?

A.—Yes.

Q.—Is it not usual to keep them on files? If they go on the files they form part of the files?

A.—All letters exchanged between officials and officials that are D. Os. may or may not go on the files. When I have received a letter if I keep it with me, it would lie with me; if I file it, it will go on the file.

Q.—Then the letters just now read by you were filed?
A.—That's true.

Q.—Was it brought to the knowledge of Government?
A.—I am not sure, on what files the letters were.

Sir M. Visvesvaraya.—Were not Government told when they launched on this scheme that there were letters of this description?
A.—I do not know, I was not there.

Mr. Billimoria.—Is there any officer who could give us that information, Mr. Duggan.
A.—I think I could find out.

Q.—(You will please tell that gentleman's name to Mr. Ewbank). In 1919, when Sir George Buchanan submitted his estimates, if you can find out from your files whether the Public Works Department were consulted by the Government or their best expert. There were two projects in 1906 and 1911, had Government called for those estimates that were prepared by your department before launching the scheme? If you can kindly get that information?
A.—All our records have been transferred to the Development Directorate.

Q.—That means the Development Directorate had full knowledge of what had passed before?
A.—All the materials are transferred to the Development Department when that department was made.

Q.—Directly the department was created or before or after?
A.—I don't know exactly.

Sir Frederick Hopkinson.—You say, the estimate of 58 lacs represents drains, etc., was that prepared by the Public Works. Have you that estimate?
A.—No.

Q.—Who has got it?
A.—The Development Department.

Sir Frederick Hopkinson (addressing *Mr. Ewbank*).—The Development Department should be asked to produce that estimate of 58 lacs.

Sir M. Visvesvaraya.—The total area to be reclaimed is 1,145 acres. You had in the year 1913 prepared a statement showing how the land was to be used. You have got it here? You intended to reserve a portion for the future Government House (page 48) From your knowledge of Bombay how would you divide the area supposing the whole of the portion were reclaimed? Of course the Military would take 265 acres out of 1,145. How would you distribute the remaining area between roads and open spaces and buildings?
A.—I should think a rough figure would be half and half. I am speaking from some recollection of the previous estimates.

A.—Has the idea of locating a Government House been abandoned?
A.—As far as I know.

Mr. Billimoria.—My friend has asked you some questions regarding the project which was submitted on 25th March 1913. I find that there you worked out a cost of square yard of Rs. 17 perhaps that must be the reduced cost per yard. If an estimate is prepared showing the cost per yard at Rs. 17 do you think it safe to put it at Rs. 7 in 1919?
A.—Rs. $6\frac{1}{2}$.

26th Witness

Mr. Bole, M.L.C.

Sir M. Visvesvaraya.—You have been a Member of the Legislative Council. Can you tell us for how many years?

Mr. Bole.—For the last six years.

Q.—Do you know why this work was started from the point of view of the man in street?
A.—My impression is they were in need of land.

Q.—But did any section of the public ask for it?
A.—I do not think so, as far as my knowledge goes.

Q.—The initiative came from the Government, you say?
A.—Yes, but later on we were told in the Council that such schemes were considered by some business firms.

Q.—It is said that the work was sanctioned in great haste?

A.—Yes, that is so.

Q.—How do you know, can you give us any facts?

A.—As far as my knowledge goes in the year 1921 when this matter was discussed at the time of the Budget members wanted more time for discussion but there was no time left and the scheme was got through.

Q.—What was the object of Government in starting this work?

A.—As I told you before, they were in need of land.

Q.—They wanted to show that Government were enterprising and they did not want the profits to go to the public as it was boom time?

A.—They wanted to have the profits themselves out of the scheme.

Q.—Have you any opinion to offer as to the manner in which the work has been carried out?

A.—Yes, I was a Member of the Advisory Committee also and there I have signed the Minority Report submitted to Government and the impression of that Committee is that no due consideration was given to the scheme.

Q.—It was not properly examined?

A.—Yes. They relied much on the experts' opinion.

Q.—Did it cause you any surprise when you saw that an estimate for 4 crores was raised to 7?

A.—Yes, it was a great surprise when we heard it.

Q.—Was that discussed in the Legislative Council?

A.—Yes, that was discussed in the Legislative Council, and members criticised the action of Government.

Q.—Can you give out any specific defects the members of the council noticed?

A.—The defects were that proper figures were not placed before the Council.

Mr. Billimoria.—That is the public were not taken into confidence?

A.—That was so.

Sir M. Visvesvaraya.—Would you like to see the work carried out by the P. W. D. or by the same agency as at present?

A.—We have asked in the council to transfer this department to the P. W. D., which Government did not like, because we wanted this department to be a transferred subject rather than a reserved subject.

Q.—Were you on the Advisory Committee and were you satisfied with your position on that Committee.

A.—Of course not because we were not allowed to transgress certain limits.

Q.—What exactly were the points on which you were consulted?

A.—Our duty was to express our views on the points put before the Committee and not to go beyond that.

Q.—Have you any other facts or figures to give us to help us in this inquiry?

A.—The figures are there in the Minority Report.

Q.—You have nothing to add?

A.—Nothing to add.

Mr. Billimoria.—At the time this scheme was launched and was announced in the Legislative Council did it not appear to the members then as a very tempting proposition?

A.—No doubt it appeared to be a tempting proposition to the Members of the Council; I am talking of the Reformed Council, the council that meet in the year 1921.

Q.—While in 1921 the estimates have increased from 4 to 7 crores, did you or any of the members had any doubts as to the scheme being gone through?

A.—Some of the members had expressed doubts as to the feasibility of the scheme.

Q.—Were their doubts removed and satisfied?

A.—They (Government) tried to remove their doubts and when the tempting figures as regards profits were placed before the Council and members were carried away.

Q.—You had at that time nothing to complain of? Because everything looked very rosy and the scheme was launched in haste?

A.—A rosy picture of the scheme was drawn and the members of the council had no time to consider it and that the scheme was launched in a hurry.

Q. May I inform you that several projects had been before the Government in the past and it was after very careful consideration that Government thought this was a very prospective proposition?

A.—This was a very big scheme and a scheme like this was never launched by Government.

27th Witness

Mr. Walchand Hirachand, Director of the Tata Construction Company

Written Statement of Mr. Walchand Hirachand on behalf of the Contractors of Bombay

1. A Meeting of the leading Indian Contractors was held last week when it was decided to tender the following statement on behalf of contractors assembled there.

Work by " Contract " versus " Departmental " method, the former superior

2. Apart from the particular instance of the Back Bay Reclamation, as a general principle, we assert that construction by " contract " is always economical in cost and sounder in quality than by " Departmental " system. The idea that departmental work is sounder in quality is based upon wrong psychology. In " Departmental " system the same staff is responsible for both " cost " and " quality " of work and as keeping the former down is more appreciated by the superiors, efforts are naturally made to attain that result even sacrificing the latter to a certain extent while in " contract system " the supervising Engineering staff have no other business but to supervise and in order at least to justify their existence they have to see that the work is up to the specification.

Note.—If desired literature on this subject giving opinions of competent authorities can be produced.

Failure of Back Bay mainly due to " Departmental " method

3. In our opinion the failure of the Back Bay is mainly due to deviating from the sounder method of " Contract System ". Had the work been let by " Contract " the obvious mistakes that are now known committed by the Development would not have been made. If a contractor wants to dredge or excavate material from somebody else's property, it is impossible to imagine that he will enter into a contract without first ascertaining from the owner whether he would dispose of the material, as the Development Department have failed in first referring to the owners—in this case the Port Trust and the Royal Indian Marine. If a contractor is to tender for excavation or dredging he first investigates the *nature of the soil* he has to deal with. If a contractor is told that he will be paid on Section measurements of area reclaimed, the first question he will try to solve is the percentage of shrinkage to be allowed. If a contractor is to engage staff for execution the first qualification he would like to ascertain is the previous experience of the candidate of similar nature of work and as far as possible in the same locality.

Contention that even by " contract " same results repudiated

4. It is contended that even if the work were let by contract there would have been the same huge deficit which the contractor would not have been able to bear and either he would have abandoned the contract or become bankrupt with the result that the Government would have been in the same position as they are to-day. On the contrary, really speaking, Government would have been in a much better position than they are to-day. If the work had been let to responsible contractors they would have completed the Scheme even with a deficit in which case the Government and the Tax-payer would have been profited. But this is just putting the cart before the horse. Had the work been let by contract, as stated above the obvious mistakes committed by the Department would not have been done, which would have avoided the deficit.

Responsible contractors available in India and Bombay

5. It is further contended that even if the tenders had been invited no responsible contractor would have come forward to undertake the scheme. But we say such a contention undervalues the strength of the contractors. In our opinion the Government need not have had to go out of India to find such contractors but they would have secured them at their doors—we mean in Bombay proper. In the year 1920 tenders were called for the construction of part of the sea wall, and it was stipulated that tenderers should state in detail the methods of construction they proposed to adopt. Out of the four or five tenders received at least two were local contractors who submitted *bonâ fide* tenders with cash deposits, but no tender was accepted. The reasons for non-acceptance of any tender were not made known at the time; nor were they available to the Financial Sub-committee appointed last year. We would submit that local contractors can carry out such works from inception to finish complete in all respects. In 1921 the Bombay Municipality had to quadruple the Tansa Water Pipe Line, estimated to cost about six crores, about double the cost of original Back Bay estimate. Tenders were invited for the Scheme and more than half a dozen tenders were received, majority of which were from Indian contractors of Bombay. The Scheme was divided between two contractors who completed the same with their own plant and machinery in scheduled time and in the contract rates. There

was no revision and re-revision except for change in design. The scheme required about six lacs brass of earthwork—the quantity equivalent to Block No. 2—not only in moorum but in hard rock, in a locality devoid of any facilities, bad malarial climate, and bulk of this quantity of earthwork was done only in thirty working months. There are several contractors in Bombay who can handle about thirty lacs Rupees worth of work every season and one Firm alone in Bombay has secured and carried out works estimated at four crores with all their own plant, machinery and capital and under the supervision of expert Engineers during the period the Development Department existed.

6. The Back Bay Scheme now mainly consists of earthwork-reclamation. Several Firms of contractors have carried out five to ten lacs brass of earthwork in Bombay. One Firm alone has carried about forty lacs brass of earthwork—which is equal to about two-thirds of whole reclamation—in times when modern appliances which greatly help progress were not available. Even to-day the Development Department are conjecturing about the cost of dry filling and the possibility of procuring sufficient moorum in the vicinity of Bombay. But for the past several years there have been Firms of contractors who own moorum hills one or two with Broad Gauge Sidings. Reclamation with dry moorum hauled by ballast trains has been and is being done by several contractors. One Firm contracted in 1920 with a Public body—we mean the Bombay Port Trust—to surface with moorum to the extent of about six lacs brass of earthwork.

7. If, in the face of this situation, one chooses to make a statement that responsible contractors will not come forward to undertake the job, he does it because he is unfamiliar with local conditions.

" Experience of Sea Face Reclamation "

8. It is said that contractors with actual experience of reclaiming open sea face will not be available. It is superfluous to raise such a criticism since after all such schemes are not every day's business. But then what actual experience even the Government as a body had when deciding to carry out the work " Departmentally " and is it not a fact that they ventured to do it relying upon hired expert knowledge? Any contractor could have been able to purchase best expert experience available in the world; in fact good Engineers (who are the men required for this type of work) prefer to work for contracting firms. Recently a Contracting Firm was entrusted with the work of driving a tunnel estimated at thirty-five lacs, which the Firm has contracted to do in only twenty-five months. Within two weeks of the allotment of the contract the Firm had on Works a Tunnel Expert from foreign lands.

Dry filling advisable, safer and cheaper than wet dredging

9. In our opinion dry moorum filling is economical, advisable and certainly a dependable method. There can be no doubt that moorum filling, besides giving better foundations eventually, is economically better. It can be developed and used immediately; time of filling is certain and can be done quicker than by dredging where material to be dredged is of such uncertain quality, quantity and deposition as in Back Bay or the Harbour. Broadly speaking, it should be possible to do dry filling between Rupees six to seven per brass. Of the cost of the dredging plant 90 per cent. must be written off to the work (Financial Sub-Committee took Rupees ten lacs as liquidation value). Plant depreciation assuming whole reclamation was by dredged filling would work out at over Rupees two per brass. It is therefore difficult to see how Sir George Buchanan in his estimate could have taken five annas per cubic yard or Rs. 1-2-6 per brass as the cost of dredged filling unless plant charge (more than a crore of Rupees) is put down as a separate item. Even as it stands the estimate includes a provision of top coat of one foot of moorum. This has been proved to be totally inadequate and five feet of moorum should be taken. Thus the amount of wet filling will be considerably decreased. Perhaps theoretically it might be possible to show on paper that wet dredging is cheaper than dry filling. But in contrast to dry filling there are so many unforeseen contingencies involved in wet dredging, *viz.*, (1) nature and quantity of soil that will be available till the completion, (2) difference between quantity pumped and the quantity ultimately retained, (3) proper working of the dredger, etc., (4) time taken for drying and the consequential increase in interest charges—that one cannot definitely estimate the cost of wet dredging till the work is complete, as one can speak with confidence of cost of dry filling.

Progress by Dry filling—any quantity of moorum available in the vicinity of Bombay

10. It is contended that it is not possible to complete the work within reasonable period by dry filling. From the evidence lodged before this Committee by the Engineers of the Development Department and members of other Committees, it appears that they are yet doubtful whether sufficient quantity of moorum is available in the vicinity of Bombay. We definitely know far more than sufficient dry moorum is available within reasonable limits. In dry filling the progress is mainly dependant upon the quantity of rolling stock available for hauling and the number of trains allowed to pass on the main line by Railways one of which is quadrupled and the other is expected to be, shortly. If the Railways are persuaded to spare eight rakes of fifty wagons (16 to 20 ton capacity)

and allow so many trains to pass on their lines, even if each rake is assumed to make only *one* trip it means about 1,500 brass of consolidated filling per day or three lacs brass per season of 200 working days. Excavating, loading and unloading of 1,500 brass per day is not a difficult job as it means a work of only three to four thousand workmen. On the Tansa quadrupling scheme of the Bombay Municipality one Contracting Firm had maintained about ten thousand workmen in a locality notorious for a virulent type of malaria and difficult of access. Last season a contracting Firm had four thousand workmen on one work alone in the deepest jungle. This will show if sufficient rolling stock is available, Block No. 2 can be reclaimed in only two full working seasons. Procuring sufficient rolling stock is beyond the control of contractors as firstly, in India, Railways do not allow running of private wagons and secondly if the contractor is to write off cost of such huge rolling stock on a work of few seasons the price of dry filling will grow unnecessarily higher.

11. We are confident if tenders are invited sufficient bidders from Bombay and India will come forward. Tenders are already advertised for reclaiming Block No. 2 but in agreement form the conditions are all one sided which will frighten the bidders with a result that prices for dry filling would be unnecessarily high and there will be unfair comparison between dry filling and wet dredging in favour of the latter. To quote few instances contractors are asked to make their own arrangements with the Railways for Rolling Stock, etc., etc. Surely Government would receive better response from the Railways, instead of each individual contractor approaching the Railway. Secondly Government do not promise the help of land acquisition machinery if a contractor finds a moorum hill. If some land owners realise the position of the contractor they are bound to demand fabulous price or Royalty and the only course possible in such cases is for the Government to use powers under Land Acquisition Act.

12. We do not desire to express any opinion whether the Scheme was at all necessary for Bombay when it was launched or whether it should be completed in all respects or in part, as this is beyond our present intention and scope. But this much we confidently assert in conclusion :—

Summary

(1) That had the work been given by contract these glaring mistakes would not have been made.

(2) That if it is decided to execute further whole or part of the scheme it should be done by " Contract system ". Sir Alexander Gibb and Sir George Buchanan agree on this point.

(3) That dry filling is more advisable, surely safer and cheaper in the long run. Sir Alexander Gibb says the same. Mr. Neilson thinks this is not a dredging scheme.

(4) That it is possible to procure sufficient moorum in the vicinity of Bombay.

(5) That if the Railways are persuaded to spare sufficient rolling stock and allow necessary trains to pass on the main lines the progress of the work will be better than dredging.

(6) And lastly reliable contractors would come forward to undertake the job.

13. We appeal to the Committee to spare a day or at least few hours to personally inspect the works carried out by the Contracting Firms in Bombay which will convince the Committee of the above statements.

14. If any further information is necessary Mr. Walchand Hirachand, Phœnix Building, Ballard Estate, Fort, Bombay, would be pleased to give personal evidence on our behalf.

Sir M. Visvesvaraya.—You are a contractor and a Director of the Tata Construction Company?

A.—Yes.

Q.—Have you any large contracts at present in hand?

A.—Yes. We are doing a big tunnel work for the G. I. P. to the extent of 35 lacs. We have got a broad gauge railway 61 miles in length in which the earth work alone comes to 6 lakhs brass. It is the Kazipeth-Balharsha railway. Roughly we have got about one crores worth of work in hand to-day. During the last six years we have completed about 4 crores worth of work.

Q.—On what aspects of the enquiry do you propose to give evidence?

A.—That is summarised in my statement at the end that, had the work been given, in the beginning, on contract, the Government would not have lost the money or come to the situation that they are in to-day. Leaving the past alone, even for the future I will strongly say that the work should be done by contract. Sir George Buchanan and Sir Alexander Gibb, as far as I understand, also say the scheme; that it is certainly possible to do the whole of the balance of the filling, if of course it is intended to be done by dry filling, with good moorum from round about Bombay. There are areas which will

give the necessary quantity. There are contractors who are organised enough in Bombay itself to undertake the work and undertake the whole responsibility, if necessary, themselves except for transport, which will necessarily have to be done by railways.

Q.—That is your general statement?

A.—Yes.

Q.—You say in paragraph 3 of your note " that if a contractor had been entrusted with the work he would have made preliminary investigations on a larger scale ".

A.—Certainly. It is impossible to imagine that he will enter into a contract without first ascertaining from the owner whether he would dispose of the material. He would not, in his own interest estimate to excavate land without asking permission for it from the owners, Port Trust and the Royal Indian Marine or ascertaining about the experience from someone else who had experience about borings and what material was available. If a contractor had undertaken this work he would have been very careful particularly in a scheme of this magnitude.

Q.—Further on you say, " the first question he will try to solve is the percentage of shrinkage to be allowed ". Do you think that a contractor would be able to think of all these points better than Government would?

A.—From the results of this case, certainly.

Q.—This is an unfortunate case?

A.—A contractor generally is much more thorough than a red-tape Government body can be.

Q.—Because he takes a personal risk?

A.—Not only that but he is not to call for sanction from Government to enter somebody else's property or for additional staff or anything else.

Q.—You further say that " tenders were called for the construction of a part of the sea wall and it was stipulated that tenders should state, in detail, the methods of construction they proposed to adopt. Out of the four or five tenders received at least two were local contractors who submitted *bonâ fide* tenders with cash deposits, but no tender was accepted ". Can you tell us why no tender was accepted?

A.—Personally till now I am in the dark why no tenders were accepted. The reason for first inviting tenders and particularly expecting the contractors to give the whole of his data as to how he expected to build the wall, from where he expected his material, and transport giving detailed cost, was to get information. The tender cost might be alone about Rs. 30,000 and it would have cost the other contractors, I believe about the same amount. Our tender was accompanied by 28 plans. The Government said after all that the whole will be done by Government, we do not want to give it to anyone. We consider it most unfair.

Sir Frederick Hopkinson.—Is that the Colaba wall?

A.—The tenders, as far as I am aware, were for portion of this wall.

Q.—Tenders were asked for 8,000 feet of Colaba wall. In what year was that?

A.—It was I think in the beginning of 1921.

Sir M. Visvesvaraya.—You do not even now know why they did not accept the tenders?

A.—I do not know.

Q.—Were you supplied with the specifications for the sea wall?

A.—The data were very scanty and we were asked to furnish our own design of doing it, our own idea as to how we wanted to do it, the estimate of cost. As regards transport and stone and cement, we went to the length of giving comparative statement of cost of steam driven lorries against petrol driven. We went into all these points thoroughly and one of our cables cost us Rs. 1,800.

Q.—You say " There are several contractors who can actually handle about 30 lacs worth of work every season and one Firm alone in Bombay has secured and carried out works estimated at four crores with all their own plant, machinery and capital ".

A.—Yes. This reference is to our firm, the Tata Construction Company.

Q.—Further in paragraph 6 you say " one firm alone has carried out 40 lacs brass of earthwork which is equal to about two-thirds of whole reclamation in time when modern appliances which greatly help progress were not available ". That is ancient history?

A.—Not necessarily ancient. It began about 5 years ago when steam navvies or cranes were available or at least well known to us as they are to-day. Some of the contractors are acquainted to-day with the latest steam navvies.

Q.—You go on to say: " for the past several years there have been firms of contractors who own moorum hills with Broad Gauge Sidings ". Can you mention one or two. We were inquiring about this a few days ago but we could not get correct information.

A.—For the last 18 years my firm has been owning huge areas of land full of moorum connected with broad gauge sidings from where lacs of brass of earthwork for the various public bodies has been brought into Bombay?

Q.—What is your brass?

A.—It is equal to 100 cubic feet. This area is situated about 17 miles from Bombay. The whole portion is about 600 acres in area and connected with the broad gauge sidings, reversing loops, steam navvies, which is capable of turning 3 to 4 lacs of brass every year easily. It contains 40 to 50 lacs brass of good moorum commercially excavatable.

Q.—Do you do any excavation by machinery?

A.—We have, as I said, two navvies of the latest model but for want of big orders we find it not much useful as manual labour is cheaper for the small output required.

Q.—Is the broad gauge siding you refer to on the G. I. P. Railway?

A.—Yes.

Q.—How far from here?

A.—17 miles.

Q.—What is the rate for moorum delivered at rail head?

A.—You mean what quantity can be loaded.

Q.—What is the rate at which you load trucks at rail head including excavating and loading?

A.—It depends on the lift and the lead. If it is 20 feet from the wagons, it will be very cheap. It makes difference if the hill is too high.

Q.—What would it roughly cost per brass for excavating and loading without any overhead charges?

A.—It will be about Rs. 1/5 or 1/6.

Q.—What maximum quantity have you ever brought to Bombay?

A.—It has always been regulated by the number of rakes supplied by the railway. The railways could supply 6 to 7 rakes of about 40 to 45 wagons which we could easily load and unload at any time. This amounted in some cases to 800 or 1,000 brass per day. We could have done more had more rakes been placed at our disposal.

Q.—Assuming you have six rakes at your disposal, what quantity have you or any other contractor been able to bring?

A.—About 800 to 1,000.

Q.—That is 4,000 cubic yards roughly?

A.—Yes, roughly.

Q.—Would it be possible, if the railway authorities gave you proper facilities, to increase that output to 12,000 cubic yards?

A.—Easy.

Q.—Supposing you had to find your own trucks, would contractors be willing to provide themselves with their own trucks and come to some arrangement with the railway for the transport of material?

A.—The railways in India do not allow private wagons to run. They do not follow the system that is followed in England and elsewhere. I had put up that proposal in boom times (in 1920-21) and they refused point blank to run private wagons as a principle.

Q.—That is the reason why you want Government to make railway arrangements for the contractors if the work is given out on contract?

A.—Yes; the rate for railway material is ·09 pies per mile per maund. The rate that the Development Directorate got for their Kandivli quarry works out to about the same or possibly cheaper. The rate for others or private companies is higher. The railway will never give that rate to any private party other than railways.

Q.—But the Development Department got it?

A.—Because this was a Government project. As regards supply of wagons and rates, Government got extraordinary concessions.

Q.—You want those concessions?

A.—Yes. Particularly the difficulty is that you invite tenders for block 2 and on the second day you make a statement to the press that no tenders are intended to be accepted or we are only enquiring. In these circumstances we go to the railway for concessions and different contractors put forward different proposals but the railways say why bother your head over it when they do not mean business. When you put in a serious advertisement, the contractors think that they do not mean business but want to enquire. Therefore there is no chance of the railways considering the question seriously, and there is not the slightest chance for the Development Directorate to get a reasonable tender in response to their advertisement, and particularly with that peculiar form which is unreasonable.

Q.—Have you got a copy of the form?

A.—Not just now. We have studied it thoroughly. It is very unfair to dry filling and invite tenders with such a very one sided inequitable conditions where naturally the contractor will put on various contingencies to meet these conditions, the result being that comparison between wet filling and dry filling will not be fair.

Q.—Will you be able to work the dredgers? You say there will be contractors forthcoming to take up the whole work.

A.—I was primarily referring to the completing of the wall and the filling by dry filling, but contractors will be prepared to take the working of the dredgers.

Q.—If proper facilities are afforded? Is that what you say?

A.—Yes. If the dredgers are handed over to them to work. As a matter of fact the Development did hand over one of their dredgers to my firm. This is the dredger for sand. And that had been handed over to my firm for working at Mumbra in the creek.

Q.—Is that a suction dredger or a bucket dredger?

A.—That I cannot tell you. I am not an engineer.

Q.—But you are managing Engineering works?

A.—I am a contractor but not an Engineer, and that dredger was worked by contract by my firm. As there is no demand for sand it is doing nothing at present. We have made an offer to take it over for working.

Q.—You say broadly speaking it should be possible to do dry filling between rupees six to seven per brass?

A.—Yes. I am purposely putting it on a very liberal basis primarily in view of the way these tenders are drafted, although I might cite one instance in exactly similar circumstances. To-day I am doing a similar work, wherein sidings at both ends are maintained at my cost and we give complete work on sectional measurements at Rs. 4-4-0, it might be 3 pies more or less, the railway haulage being about 7 to 8 miles as against the 20 that might be here, and the stuff deposited not in water as in block No. 2. A straightforward plain contract will give you a much cheaper quotation.

Q.—Would it be inconvenient to contractors to take measurements on the sea shore here before it is tipped into the blocks?

A.—No. I think it will be unfair to big contractors as also it is open to unknown liabilities to the Government. I would not advise it for a public body to do it.

Q.—There will be uncertainty about shrinkage, is it not? You will not be able to follow the progress of the works.

A.—Taking measurements over in wagons or stacks will affect the progress. It is also liable to be abused. A respectable contractor would like to avoid that even by accepting some risk in sectional measurements.

Q.—But if delivery is given at site on the sea shore your responsibility ceases there. You have no responsibility for any shrinkage.

A.—That is true, but that uncertainty will be only between 5 and 7 per cent., at most 15 per cent. If the Department says it will be 15, the contractor will take it at 25. But the figure of uncertainty will be between 5 and 7 per cent., at the most 10 per cent.

Q.—Can you get soil of any other kind for filling in besides moorum?

A.—I am not aware of any.

Q.—Any material should do for filling.

A.—You mean cheaper material? No, I am afraid round about Bombay you will find moorum throughout also comparatively cheaper.

Q.—You say, " We definitely know far more than sufficient dry moorum is available within reasonable limits ". Are you satisfied on that point?

A.—Yes.

Q.—From what locality?

A.—There is one hill belonging to us that alone should give the bulk of the quantity required if the whole were intended to be done. There are besides other areas of which I am aware, and which are within a reasonable distance, even nearer than Kandivli, which will give the required quantity.

Q.—If you can get at the rate of about 12,000 cubic yards a day, combined with dredging, you might be able to complete the work within 4 years.

A.—12,000 cubic yards per day of dry filling will give you 6 lakhs of brass a year with 200 working days in the year.

Q.—You take only 200 working days? Could you not work longer days?

A.—During the rains as far as possible earth-work is avoided. If there is urgent work or the contractor is compensated for he will try to work during the rains, but efficient economic earthwork is generally stopped in Bombay, and that is why we on an average take 200 working days in the year. It will give you six lakhs of brass of dry filling.

Q.—As regards land acquisition and railway facilities you want arrangements made by Government?

A.—Yes, in the case particularly of way leaves. The hill can be acquired by a contractor, but access from the hill to the railway may present difficulties. One small rice field comes in belonging to some widow who is not empowered to sell. The

contractor is absolutely stuck owing to that one acre of field. There the Land Acquisition Act must be and should be requisitioned.

Q.—Finally you say, " that dry filling is more advisable surely safer and cheaper in the long run. Sir Alexander Gibb says the same. Mr. Neilson thinks this is not a dredging scheme and that it is possible to procure sufficient moorum in the vicinity of Bombay. That if the Railways are persuaded to spare sufficient rolling stock and allow necessary trains to pass on the main lines the progress of the work will be better than dredging."

A.—This is a practical proposition. The Railways have done so in the past even when quadrupling was not there. Now there is quadrupling on one of the Railways and the other is expected to be shortly.

Q.—But we have to consider whether dredging would be cheaper or moorum filling. Do you care to discuss the rates? At what rates will it be possible to get material; assuming favourable conditions, what would be the cost of filling by moorum and by dredging respectively.

A.—As regards dredging I have got no data except as I read in the papers.

Q.—It is said that the cost of dredging will vary from As. 12 to Rs. 1-5-0, and possibly the average may be less than Re. 1.

A.—But it does not take account of interest or depreciation. Is it fair then to compare? In my case it takes into account interest, depreciation and all charges. Depreciation alone according to my calculation knocks out wet filling altogether. A crore and a half worth of plant to be distributed over this whole quantity absolutely washes it out.

Q.—But this expenditure has been incurred.

A.—Is it logical because that expenditure has been incurred to take it at zero.

Q.—We have to see what is to the utmost advantage of the works and not of contractors.

A.—Even then the uncertainties having been particularly seen, and observing the behaviour of that wet filling which requires more than five years to dry (I am told you are allowing one year to dry. With my personal experience I tell the Committee I have tried to walk over that filling after five years and it was unsafe).

Q.—Where is it?

A.—In the Mazagon-Sewri reclamation. For five years the land did not dry, sufficiently dry for building purposes or other purposes. I have myself done bulk of the topping in the Mazagon-Sewri reclamation. In many places as much as 6 feet of surfacing has to be done. If the Committee would care I would like to show the bulk of that portion which shows that 4 to 6 feet of topping is required. I believe you have taken 1 foot in the estimates. That will upset the cost of wet filling certainly.

Q.—We have to consider all these points before making our recommendations. We want your views as to the comparative cost.

A.—Mine are, in the absence of authentic information about the working of your dredgers, if you allow five years, interest charges will absolutely change the whole data. Then 1 foot of topping has been allowed, which I consider is not only insufficient, but will also change the whole of the wet dredging estimate. Then there are the uncertainties about the working of the dredgers, from what I have seen or heard of the performance of the " Jinga " or the " Kalu ", an average of 6½ to 7 hours working per day was attained by the detention caused by breakdowns.

Q.—There is some improvement now?

A.—It may be rather nominal.

Q.—They propose to work 24 hours in three shifts?

A.—For 4 years they did not. The Port Trust for 6 years did not. Their average was about 7 hours or something of that sort. Why should you now take 24 hours or 22 hours I do not understand. Add to this the breakdowns. The " Jinga " I believe is even now under repair for 3½ months in dry dock. If you provide for all these and where interest charge is such a big item, to depend on these uncertainties is unsafe! We are not sure of the quality of the material in Back Bay nor of the quantity for dredging, nor of the performance of these dredgers. These three uncertainties will certainly upset all calculations as to costs, particularly owing to interest charges and various other considerations. In wet filling you cannot start earning revenue till the whole block is filled, dried and topped with moorum. In dry filling you can start almost straight off. You leave the last 10 feet or 20 feet strip and make your roads and possibly buildings on the area. Your interest charges will therefore be small and you will be earning revenue if there is a demand for your building area.

Q.—Will you forget for a moment that you are representing the interests of contractors, and give us your independent opinion about the origin of the scheme, the conduct of the scheme and your own view as to how the works should be completed? First of all about the origin of the scheme. They say it was begun in a hurry and the estimates were

not prepared in sufficient detail. Have you studied the project from the commencement? Have you gone into the details?

A.—I have been a close student of the scheme from the very beginning.

Q.—As a business man you might be able to give your own views about the conduct of the scheme?

A.—As regards hurriedly undertaking the scheme there cannot be a difference of opinion.

Q.—What was the object with which Government rushed the scheme? Why were they in such a hury at that time? Was it because of the boom or the atmosphere around them?

A.—Yes, boom in land prices.

Q.—They also expected large profits?

A.—On the data or figures given to them, yes.

Q.—Were they justified in starting the scheme on the figures given to them?

A.—Not on the insufficient data.

Q.—We know now the data are insufficient. Had they opportunity of doubting the data then?

A.—Certainly.

Q.—What makes you think so? There was Mr. Kidd's estimate of 1912, and this was an advance on that?

A.—A responsible body like Government should weigh and make sure of their data. The Consulting Engineer is guided by the data placed before him. Government takes the data of a contractor who took only wash borings and the Government do not go to the Port Trust who are there for 50 years or the Royal Indian Marine, both of whom have got as far as I am aware very full and elaborate information, and who I understand would have welcomed any enquiry (I know the then Chief Engineer, Mr. Messent was extremely annoped when he saw no one approached him. He said, " We are the people who ought to know, and no one comes to us ") particularly in placing orders for crores worth of dredgers they did not go to their neighbours who had almost exactly similar machine, they did not go and ask them for its performance, price or anything! If I want a motor car I ask my next neighbour what she is on petrol, etc. One public Department does not care to go to another public Department and certainly the only qualified Department to give the information. And particularly in a local scheme wherein detailed knowledge of Bombay conditions was essential to studiously avoid all Bombay engineers directly or indirectly connected with Bombay. They studiously brought out men who never knew what Sewri was, where Back Bay was. They began studiously avoiding Bombay men, whether it was the P. W. D., or Port Trust or any Department. Even for a quarry which is nothing else but a study of the formation of rock in the vicinity they brought out men who had never been near Bombay.

Q.—You mean in the selection of men to operate the quarry?

A.—Yes.

Q.—Have you any defects to find in the conduct of the works since they were started? And would you suggest any modifications in the way the work should be carried out in future?

A.—Even leaving the contractors' interest alone, I think as a citizen I would insist, and I think the Legislative Council also want the same, that the balance of the work must be done by contract. I think both the Consulting Engineers say the same, and curiously enough that is the only point they agree upon, Sir Alexander Gibb and Sir George Buchanan who differ on almost every point except this that the work ought to have been done by contract.

Q.—What are your recommendations for the future? Would you complete blocks 1 and 8 or not?

A.—I would like to have more information before I can say anything about that.

Q.—You have not read the *interim* report of the Advisory Committee?

A.—Since then we were promised the Neilson Report and the Kay Committee's Report. Until the Neilson Committee and the Kay Committee's Reports (costs in the Kay Committee will be based on the Neilson Committee's report) are received, I will not be able to give an opinion.

Q.—Speaking generally, are you in favour of the completion of the work or do you wish to go slow?

A.—From the point of view of the community's financial standing I go slow. I would not dump the land market yet with a big quantity of land in a short time of 10 years or so.

Q.—Lastly, assume your own conditions and give us a rate for moorum at which contractors could supply in future. At present the rate calculated by the Development Directorate is Rs. 1·57 per cubic yard.

A.—Of that I am doubtful. It does not allow for any overhead charges.

Q.—It allows 15 per cent. shrinkage?

A.—I think it does not. My impression of what Sir Lawless said here was without shrinkage 4·98, with shrinkage 5·79 or something, and even then overhead is not allowed in 5·79. If overhead is 15 per cent. that rate will come to Rs. 6-5-0. With a responsible contractor the overhead will be reduced to a small amount.

Q.—Suppose including shrinkage the rate is Re. 1·57 now, what reduction would be effected by employing a contractor? Give us the rough idea of the cost.

A.—To-day I am doing the work on a basis of Rs. 4/4 the only difference being in the haul. My haul is 7 miles as against your 19, and there is a little difference in the shrinkage. Rs. 4/4 is Rs. 1/1 roughly per cubic yard. An extra 12 miles should cost about as. 11 or 12 per brass.

Q.—In the first instance would a contractor bring it from a short lead?

A.—Certainly if he got a hill and a siding he will.

Q.—Is he likely to get then?

A.—Yes.

Q.—Assuming that the total quantity required is about 22 million cubic yards, and say about 12 million cubic yards have to be done by moorum filling, at what rate could that moorum be delivered here. Give us a rough figure. You do not commit yourself, it is not a tender. You make your own calculations and give us a figure at the end.

A.—The contractor will save a rupee to the Department, a saving of about a rupee equivalent to 15 per cent. or 16 per cent. on the present costs of the Development as I understand them and therefore no exposure to unlimited liability for the Government.

Q.—I want a figure.

A.—If Rs. 6/6 is the Development Department figure, being Rs. 4·98 and 15 per cent. for shrinkage and 15 per cent. overhead, my figure is Rs. 5/6.

Q.—Is that for a lead of 18 miles?

A.—I am basing it on existing quarries as they are.

Sir Frederick Hopkinson.—I have seen for the first time a few minutes ago this document inviting tenders for doing the work and gather from the remark that you made that this might almost be described as a tender to get a high price and not a low price?

A.—Exactly.

Q.—I see the cost of all the settlement of the moorum not in itself but into the mud below is to be upon the contractor. That settlement might be 100, 200 or 300 per cent. Well, I think I should be inclined to agree with you that is a way to get the very highest possible price. Now you said something about tendering for the Colaba wall, and having been put to a great deal of expense in making the tender, and the tenders, so far as you know, were not considered. Can you tell me a little more about that? Did they ask you to find all the materials and plant for that?

A.—Everything.

Q.—Did they ask you to lay a railway from Marine Lines to Colaba point or leave you to get in any way you could?

A.—They left us to give our own design and the method of executive in very elaborate detail.

Q.—They gave a schedule of quantities, did they not?

A.—If those tenders are traced they will furnish very valuable reading. They were carefully prepared. Two contractors sent men all the way from England. Each of them must have spent thousands of pounds on them, and it was all scrapped without giving any reason.

Q.—Did they at the same time ask you to deliver them in detail how you proposed to do it in detail?

A.—In the most elaborate detail. We even went into the comparative cost of a steam lorry and a petrol lorry. They asked us where we intended to transport stones from.

Q.—What did it matter to them how you transported it. They were going only to pay for the finished work?

A.—I do not know whether they wanted to get information at anybody else's costs. It was no consequence to them. They stipulate you must do so and so, and the moment you deviate, your tender is thrown out in India. There is difference in the treatment to contractors in America or England or any other civilized country and India. A contractor is treated worse than a cooly.

(*Sir Frederick Hopkinson.*—You have my deepest sympathy.)

Q.—You spoke just now about wash borings. Did you ever know of wash borings made in the clay?

A.—I am not an engineer, but this is what I am told by people who know. I am not responsible for the details of it, nor am I aware of the technical details.

Q.—Have you ever heard of any one making wash borings in solid clay?

A.—I could not answer that question.

Q.—You have had a wide experience of prices of materials and labour during the last 10 or 20 years?

A.—Yes.

Q.—Can you tell me the approximate rise in the value of labour, materials and plant between the years 1912 and 1919 in Bombay? Before you answer that question can you say if the year 1919 was somewhat a peak?

A.—Rather 1920. 1919 was below the peak.

Q.—Much or little?

A.—It depends much on imported materials.

Q.—I am asking you now generally as a contractor. Was there a considerable rise between the years 1912 and 1919 in prices of labour, plant and materials?

A.—There was a rise in labour and a decent rise.

Q.—Plant?

A.—You will possibly be in a better position to say. If you could give me some time I will send the information about the others later on.

(*Sir Frederick Hopkinson.*—Thank you very much.)

Q.—You know the district of Bombay very well?

A.—Yes.

Q.—Do you think it would be at all difficult to find sufficient material within reasonable distance for the purpose of completing the work?

A.—There will be no difficulty whatsoever.

Q.—You said that moorum filling is cheaper than dredging?

A.—Considering all the factors.

Q.—But moorum costs Rs. 1·57 per cubic yard, *i.e.*, Rs. 1/8 roughly. We have been told that the actual dredging cost for the last year from the harbour was a little over 8 annas. That does not include depreciation or interest, but the actual working cost. How could you reconcile that with your estimate of moorum as cheaper?

A.—I want to allow interest and depreciation which I think should be allowed.

Q.—When you deal with the plant you have got depreciation going on all the time, unless a god-father comes and is prepared to give you back its original price?

A.—Yes.

Q.—Your interest similarly is bound to go on whether the dredger is working or lying idle?

A.—Yes.

Q.—Therefore, if you could do dredging at 8 annas, it is far cheaper than moorum filling?

A.—If that figure is correct and dependable.

Q.—Therefore that would invalidate your remark that moorum is cheaper?

A.—If the 8 anna figure, which Sir Alexander also seems to doubt, is correct. There are also other uncertainties involved and the saving of interest. You must also allow the land to dry.

Q.—Do you agree that one year is sufficient for that?

A.—No, it will take five years.

Q.—But you can put a sufficient tipping of moorum in order to make it possible of being used?

A.—You should wait until it dries.

Q.—The buildings can be put up on piles?

Witness.—Will you do the same thing for sewers, drains, etc.?

(*Sir Frederick Hopkinson.*—Oh, yes.)

Q.—You said just now that you have got 200 working days in a year's work. Surely you would not do that if you have got a large and expensive plant?

A.—My plan is for dry filling. It is not an expensive plant that I have to find.

Q.—You would think of working only 200 days?

A.—This has to be done, or else work during the rains will have to be done.

Q.—In any case you may have to hang up the completion of the scheme on account of the monsoon?

A.—Generally we knock off all the work. The wagons which are required for earthwork are supplied by the railwaps and two months are employed in overhauling, and so only two months are wasted.

Q.—Assuming that you are working the whole year, how many working days could you count upon?

A.—Not more than 280. On some of the days we find that there is incessant rain.

Q.—A figure of about 280 days has been given to us by somebody. Do you think it is excessive?

A.—Unless extra rates are paid as for urgent and immediate work. Normally we take 200 days.

Q.—Not when you have to keep expensive plant lying idle?

A.—No. You have 52 Sundays too and the monsoon days count for a 100 days idling.

Q.—That means the number of days that you could work is 265 days?

A.—If we are not idling during the rains.

Q.—Suppose you are pressed to do the work. For how many days can you do the work?

A.—250 or 260, not more.

Q.—Can you tell me if the B. B. & C. I. Railway Company or any other railway company can supply a large number of empty trucks for the purpose of bringing down moorum?

A.—I made some enquiries before this tender was out, and I was told by the G. I. P. Railway Company that it was possible, but they would not commit themselves until I wrote to them giving a definite proposition. When the tender came out we did not do anything.

Q.—You are not going to put in a very low tender?

A.—Not on the basis of this form.

Q.—You suggest that you are prepared to take the work and to complete the whole work?

A.—Yes.

Q.—Have you done any harbour work?

A.—As I have said the bulk of the work is only reclamation work, besides a small piece of wall to be done.

Q.—You know of that, because you have seen it done?

A.—Not only that. We did tender at the very beginning before we had this experience. Therefore we can now do it.

Q.—In that tender for the Colaba wall did I understand you to say that they asked you to supply detailed costs of the work you were going to do for them?

A.—Yes.

Q.—It is difficult to find a polite word to describe that?

A.—We were so polite that we never raised even a word of protest.

Q.—On page 2 of your statement you say " Had the work been let by contract the obvious mistakes that are now known committed by the Development would not have been made ". Don't you think you might alter that to " might not have been made "? I am sure you are subtle enough to see my point, because this is a suggestion that the contractor never makes mistakes.

A.—We are speaking comparatively. As compared to the Development Directorate the contractor is a very superior creature.

Q.—You think he could not possibly make as many mistakes as the Development Directorate?

A.—No. he cannot make such obvious mistakes.

(*Sir Frederick Hopkinson.*—I will rather privately give you my answer to that.

Witness.—After all, this is an Indian contractor's English and not that of an Englishman.)

Q.—I am only suggesting the alteration of a single word. You say on page 5 that any contractor could have been able to purchase best expert experience available in the world. A man of your experience does not require surely to purchase any expert experience?

A.—Possibly I think the word " purchase " is wrong. Hired or employed would have been better.

Q.—But even then he would not hand himself over to an expert?

A.—It depends on what the state of the work is: how much of local knowledge is required and how much exactly of technical knowledge is required.

Q.—The business of a contractor is to take all those roads radiating to one point, and that point is the contractor. And if he does not understand one of those roads, he would probably have to end up in the bankruptcy court. I am afraid I should get into hot water if I say nothing about your paragraph No. 9. Has not Sir Alexander said something of that sort, possibly in some cases in stronger words? Generally speaking looking at this work as a whole from the beginning, would you describe it as risky or difficult work?

A.—No.

Q.—Would you call it rather commonplace, simple, easy?

A.—Yes.

Q.—Nothing to prevent a contractor of experience from giving a close price for?
A.—Nothing.

Q.—So simple and easy that he has not got to put on a large margin for risks and contingencies?
A.—I agree.

Q.—Can you see any risk in the work as originally started: can you see any big risk as in this proposed tender for the supply of moorum filling? Don't you think that the risk in this last tender is greater probably than the risk originally shown for the entire contract? You have got a risk of one, two or three hundred per cent?
A.—Yes.

Q.—That is a greater risk you are asked to take in a limited contract for moorum than a contractor would have originally had for the entire scheme?
A.—He would have made his enquiries then and even now the same way. The contractor would go and see things for himself.

Q.—The risk of taking the entire work is a probably much smaller risk than in taking this small contract for moorum filling?
A.—Yes.

Q.—And that is why I describe your answers as a suggestion that they were trying to get as high a price as possible in framing the estimates?
A.—Possibly for the wet filling to be shown as cheaper.

Q.—Now as to the difference between departmental and contract work, which would you say is the more economical?
A.—Work by contract certainly.

Q.—And which is the speedier?
A.—Work by contract.

Q.—In taking a contract if the contract is properly drawn up, the contractor is told exactly what he has to do?
A.—Yes.

Q.—If variations are made afterwards, they are almost invariably variations that increase the cost?
A.—Generally there are changes in designs which generally increase the cost.

Q.—But that does not matter to him, because there is the schedule of prices and he is paid for any alterations that are made?
A.—Yes.

Mr. Billimoria.—Assuming that a sufficient quantity of moorum, as you say in your report, is available within reasonable limits, from a contractor's point of view would it not be safer and desirable to undertake the filling in of one or more blocks, watch the result and compare the estimates of cost, before undertaking a huge contract for the completion of the work?
A.—That might be right for an amateur contractor or a contractor coming from foreign lands who has no experience of Indian or Bombay conditions. But a contractor who knows his job and who has the experience, as some of these contractors I am referring to have, will not mind, and would rather like to put in a bid preferably for the whole.

Q.—Would it not be in the interests of Government not to place a large area of land on the market with a view to realise a better price from the sale of land?
A.—Yes. It will be undesirable to dump on the market a big block of land to be sold.

Q.—If small beds are reclaimed and the whole reclamation spread over a number of years, would there not be a considerable saving of interest and prospects of better prices being realised?
A.—That is the beauty of dry filling. You can stop at any time. With wet filling you cannot, unless the whole block is complete.

Q.—You prefer the work being given to contractors?
A.—Yes.

Q.—You yourself belong to a firm of contractors and as such in a way are an interested party, are you not Mr. Walchand?
A.—I was prepared only to give evidence as a contractor and the other questions I did not come here for.

Q.—You also told us that tenders have been invited?
A.—Yes.

Q.—You are likely to be one of the tenderers, and as such have a proportionate interest also in the future as a tenderer?
A.—To that extent.

Q.—Did you on a previous occasion submit any tenders to this department?
A.—You are not referring to big tenders? I had tendered for the wall.

Q.—Because you had spent some money and did not get the contract, you now make a grievance against the department as a disappointed contractor?

A.—Any other contractor would have got it. Every day we get tenders after tenders and disappointment after disappointment and we have no grievance against this department at all.

Q.—Your grievance is not because you did not get a tender?

A.—No.

Q.—You told us that you know of some hill or property that can produce a sufficient quantity of moorum. Naturally you would be anxious to get rid of that property?

A.—I would like the moorum to be utilized.

Q.—Then you said that between your property and the railway line if there was some one else's property you will ask the Government to acquire it by a notification?

A.—This does not apply to my property. In the interests of some competitors I am giving this tip to Government.

Q.—For whose benefit would you recommend the Government to spend money at the expense of the poor landlord?

A.—The landlord gets full compensation. I recommend this in the public interests and so long as he gets compensation there should be no grievance.

Sir Frederick Hopkinson.—I have no doubt that this Committee in giving recommendations to the Government will fix the prices for the various works. And these prices, whatever you or anybody else may say, will be based upon what the Committee thinks the Government ought to pay, having regard to doing it in the very best possible and most efficient way.

A.—Yes.

28th witness

Mr. H. P. Mody and Mr. B. G. Horniman (Representatives of the Bombay Municipality)

Messrs. H. P. Mody and B. G. Horniman, representatives of the Corporation of Bombay, were examined.

Written Statement put in on behalf of the Municipal Corporation of Bombay

The Corporation have no desire to go at any length into the past history of the Back Bay Reclamation Scheme. The second *ad-interim* report of the Advisory Committee and the disclosures which have been made during the last few days before the Back Bay Enquiry Committee are sufficient condemnation of the reckless manner in which the scheme was launched by Government, and of the ineptitude shown by the Department in carrying it through. In common with other public bodies at the time the scheme was announced the Corporation were anxious to be placed in a position to criticise the details of the scheme and to have a share in the shaping of it. But the opinions of the Corporation as expressed in their resolutions and in the speech in the Legislative Council of its Representative were ignored by the Government with the same indifference which they displayed towards the representations of other public bodies. It was confidently proclaimed that the scheme was a very sound proposition both on its financial and technical side and all the warnings conveyed to Government by representative public men and bodies were ignored. It is true that in response to the insistent demand for a voice in the administration of the project an Advisory Committee was constituted, but its functions were so circumscribed and its opinions were so persistently discarded that the Advisory Committee had no utility as a controlling body. For all practical purposes the Development Department was absolutely autocratic and unrestrained in the exercise of its functions. The result has been a failure unparalleled in the history of any important undertaking in this City since the hectic days of the Share Mania. Even worse than the mismanagement of the Department has been the way in which it has continually sought to mislead the public until exposure became inevitable. Reassuring statements were made from time to time by the Department even when it knew that all was not well with the scheme and that it was ultimately going to prove a ghastly failure both on its financial and its engineering side. What is even more regrettable is that the Government were quietly looking on while the Department was deluding the public, and from time to time themselves attempted to throw dust in the eyes of the public. All this can be amply demonstrated by the reports of the Development Directorate and by the statements made by Government in the Legislative Council. No condemnation can be too severe for a proceeding of this character and the Corporation hope that the Back Bay Enquiry Committee will take strong notice of the method in which the public has been deceived in connection with the scheme.

In view of all this the Corporation are strongly of opinion that the Development Directorate as at present constituted should not be allowed to carry on the scheme any further

towards completion. They reiterate the demand put forward by the Indian Merchants Chamber as far back as 1921 that the Development Department should be a Transferred Subject so as to make it more amenable to popular control. The suggestion is not only that the Development Department should be a Transferred Subject henceforth, but also that the Advisory Committee attached to it should have powers of effective control at every stage and should not be merely a farce as it has been in the past. There should be a large preponderance of representation of the Bombay Legislative Council, the Bombay Corporation and other important public bodies on this Committee. It is only when effective popular control is achieved in the conduct of the activities of the Department that there will be any reasonable prospect of retrieving the Province from the financial disaster which has overtaken it through the policy of both the Bombay Government and the Development Directorate.

As regards the prosecution of various portions of the scheme which are now under consideration, the Corporation cannot commit themselves in advance to approval of any one of them. There are two Committees sitting at the present moment deliberating on the financial and technical aspects of the scheme and until they have made their reports it is not possible to express a definite opinion. The Corporation reserve to themselves the right of representing their views when the reports of these Committees are published. Subject to this reservation it would appear as if the completion of Scheme No. 8 should be proceeded with, as it is understood that a large part of it has been completed and there is a buyer ready at hand. What the Corporation feel, however, is that in view of the fact that the agreement with the Military Authorities was entered into at a time when the whole scheme was expected to cost a certain figure, now that that figure has been greatly exceeded it is equitable that the Military Authorities should be moved to revise the agreement and make it more in accordance with the present day cost of the undertaking. As far as can be ascertained at present the price fixed with the Military Authorities was more or less approximated to the cost of Scheme No. 8 and it is submitted that it would be unfair that the Military Authorities should be presented with a large area of land in the best part of Bombay at a figure much under the ultimate cost of the undertaking. If the reports of the two Committees show that the completion of Scheme No. 1 can be accomplished at a reasonable figure, then in view of the work that has already been done on it the Corporation think it would be advisable to complete it. In order to guard, however, against any possibility of further miscalculations it is suggested that tenders should be invited for the work to be let out on contract at a reasonable and definite figure to some firm of repute and strong financial position.

The Corporation have also another suggestion to make and that is with regard to the adjustment of the respective liabilities between the Government of India and the Government of Bombay. It seems that over and above the Development loans there have been various advances made by the Government of India to the Bombay Government in connection with the scheme. The Corporation submit that the Government of India should seriously consider the question of relieving the provincial finances to the extent of these advances. It might well be argued that the Government of India are partly responsible for the financial disaster which has overtaken Bombay, by the light-hearted manner in which they accorded their approval to the scheme which had been turned down repeatedly by competent opinion for more than a decade and with regard to which they themselves had taken up a strong attitude of disapproval all these years. It must be remembered in this connection that the Government of India's sanction was obtained on an original estimate of 4 crores of rupees which was doubled within a very short time and yet the Government of India do not seem to have worried over the financial prospects of the scheme but seemingly allowed the Bombay Government to have a free hand in the matter. Under these circumstances it is not too much to suggest that the Government of India should bear some share of the loss which has accrued.

In conclusion, whatever scheme is undertaken, the Corporation reiterate their demand that the execution of it should be no longer left in the hands of an autocratic body which has shown itself incapable of discharging its responsibilities nor should the Government of Bombay retain the control of the undertaking in their hands in the same irresponsible way in which they have done hitherto, ignoring not merely public criticism but misleading the public into thinking that all was well with the scheme and that the fears loudly expressed on all sides with regard to it were idle and arose from interested motives.

Messrs. H. P. Mody and B. G. Horniman, representatives of the Corporation of Bombay, were examined.

Sir M. Visvesvaraya at the outset expressed his regret that the Chairman (Sir Grimwood Mears) could not be present, owing to indisposition, to meet the representatives of the Corporation.

Sir M. Visvesvaraya.—What is your full name, Mr. Mody?

A.—H. P. Mody.

Sir M. Visvesvaraya.—What is your full name, Mr. Horniman?

A.—Benjamin Guy Horniman.

Q.—Are these your own views or those of the standing committee or any particular committee?

A.—*Mr. Mody.*—These are the views of the committee appointed by the Corporation at a recent meeting; they were asked to formulate a statement and appoint representatives to give evidence before this Committee.

Mr. Horniman.—I would like to add that the statement represents the views of the Corporation; we have full authority to represent the views of the Corporation. It has been drafted and approved by the Committee.

Sir M. Visvesvaraya.—In this statement you have expressed the views of the Corporation as regards the origin and conduct of the works and you have also made some specific recommendations for the future?

Mr. Mody.—Yes.

Q.—You say that 'the opinions of the Corporation as expressed in their resolutions and in the speech in the Legislative Council of its representative were ignored by the Government with the same indifference which they displayed towards the representatives of other public bodies'. Do you wish to mention any particular instances? We want facts chiefly.

Mr. Mody.—When this scheme was first announced the Corporation represented to Government that they wanted a share in the administration of the project, and in particular they wanted the scheme to be submitted to them for their views, with full details. That was in 1920.

Sir M. Visvesvaraya.—Before the scheme was submitted for sanction?

Mr. Mody.—First of all, Sir, before the scheme came to the Corporation, there were speeches made by the representative of the Corporation on the Legislative Council, Mr. (as he was then) Chunilal Mehta and by Mr. (as he was then) Pheroze Sethna who, though not a representative of the Corporation on the Legislative Council, still was a prominent member and therefore could be expected to know the mind of the Corporation.

Q.—Any other instances in which Government ignored your views?

A.—I am coming to that. On the 19th of August 1920, the Corporation pass a resolution in which they say amongst other things 'that they are strongly of opinion that as a body vitally interested in the matter, an opportunity should be given to them of expressing their views on the various schemes under consideration.'

Sir Frederick Hopkinson.—I wish you to remember that our enquiry is confined to this one scheme, the Back Bay Scheme.

Mr. Mody.—But this resolution refers to all those schemes.

Sir M. Visvesvaraya.—Your representation refers to all the schemes?

A.—The present representation deals with only the Back Bay scheme. In the same resolution, the Corporation say 'that the President be asked to request His Excellency the Governor in Council to submit the detailed proposals of the Government for the consideration of the Corporation'. Then on the 27th August 1920, the Corporation met in committee. The whole House was then in Committee. At this meeting, Mr. Chunilal Mehta, as the representative of the Corporation, reported what transpired at the meeting of the select committee and the following mandate was given to Mr. Mehta: 'That the representative of the Corporation on the Legislative Council should be asked to request Government for an assurance that the Corporation should have a fair representation on any agency or board that may be constituted to carry out the various development works that are now under the consideration of Government'. At this committee meeting of the whole House, Mr. Chunilal Mehta said, amongst other things, that when he asked certain questions in the select committee about reclamation he was actually ruled out.

Mr. Billimoria.—This was at a very early stage when the operations on the reclamation had not yet commenced?

Mr. Mody.—Quite right.

Q.—In what directions were the questions asked?

A.—To elicit information.

Q.—About the details of the scheme?

Mr. Horniman.—The Governor had already made his speech indicating that the reclamation project was to be begun and the Corporation representative endeavouring to get information about it in the select committee was ruled out.

Sir M. Visvesvaraya.—Was it after the speech in the Indian Chamber?

A.—I am referring to the speech introducing the first reading of the bill.

Q.—We want only points to confirm the statement that your views were ignored.

A.—What I want to say is we repeated this request several times through our representatives in the Council; our accredited representative Mr. Chunilal Mehta and prominent members like Mr. Pheroze Sethna and Sir Dinshaw Petit, repeated on several occasions, that the Corporation as the body primarily concerned in the development of Bombay should have a voice in the shaping and the execution of the scheme; and an executive committee was also suggested amongst the measures which would achieve that end. I may remind you, Sir, in this connexion of the reply given by Sir George Lloyd. He said that it was apparent from

the speeches made that there was an idea that there should be representation of various public bodies on this Development Directorate that he was contemplating. He (Sir George Lloyd) wanted to point out that that was a total misconception of what this body was going to be. These are the words which he has used—(*Bombay Government Gazette* Page 698): "Honourable Members went on to suggest that the Municipal Corporation should be represented on the Development Directorate. It was that request or suggestion which drew my attention to the obvious fact that Honourable Members had entirely failed to appreciate what form of body this was going to be." And this is the paragraph to which I invite special attention "No Corporation or outside authority can be represented on Government as such. What I have stated is that we merely desired our own authority to be as expeditious and efficient as possible. Instead of dealing with any overworked highly charged department, we are creating a department of our own, new and up-to-date, to deal solely with these matters with no additional powers of interference of any kind."

Mr. Billimoria.—That was in connexion with the formation and the establishment of the Development Department which was inaugurated in connexion with this scheme?

A.—Right.

Q.—And was the opinion of the Corporation not regarded or disregarded, as you say?

A.—This Department, as you know, deals both with the housing schemes in the north of the island and with the Back Bay reclamation. The department was formed for both these purposes and for other schemes, which were then under contemplation. The Corporation wanted in the first instance the detailed proposals before them; they also desired a direct representation on the department; and their representatives further pressed, as I have pointed out, for an executive committee. All these representations, I say, were turned down and the department was created subject to no control of any sort except that of an advisory committee constituted later on in response to public opinion.

Sir M. Visvesvaraya.—What do you think were the weak points of the advisory committee?

A.—The advisory committee was advisory, that is to say, in the sense that it had a legal right to tender advice but there was no legal obligation on the part of any one to listen to it.

Mr. Billimoria.—Mr. Mody, will you give us the date of the speech of His Excellency Sir George Lloyd to which you referred now?

A.—I have not got the date just here.

Mr. Horniman.—It was at the time of the second reading of the bill.

Mr. Mody.—I can send it to you later on. It is on page 698 of the *Government Gazette*, 1920.

Sir M. Visvesvaraya.—Then you go on to say, "For all practical purposes the Development Department was absolutely autocratic and unrestrained in the exercise of its functions." Can you give us specific instances? We are collecting facts for study.

A.—I can recall two instances, one of which was a notice of motion sent by Dr. Sukhia, one of the representatives of the Corporation on the advisory committee. Of course, I am bound to admit that his motion was of a sweeping character; but it was ruled out on the . . .

Sir Frederick Hopkinson.—What was the motion?

A.—"Whether the Back Bay Reclamation Scheme should not be abandoned for the present or postponed for at least 5 years." That was on 20th June 1921. Then, Sir, another instance of that is given in the representation, which I believe is now before your Committee, of the Indian Merchants' Chamber and Bureau and in that reference is made to Mr Lalji Naranji's statement that he also asked certain questions but he was ruled out. You would like to know the reply which Sir Lawless Hepper gave to Dr. Sukhia's notice of motion "Whether or not the policy adopted by Government in regard to reclamation of Bombay should be reversed is not therefore a matter which can suitably be discussed by the advisory committee." You will find this in the dissenting minute of Mr. Manu Subedar; and if you ask me why I say that the Development Directorate conducted operations just as they liked,—it is all in the minority report and other papers—I say that in all those matters that they placed before the advisory committee no sanctions were taken and no estimates were placed.

Q.—What are the instances of "Unrestrained"?

A.—Well, all the Estimates were never placed before the Advisory Committee by the Director of Development.

Q.—So no estimates were placed before the Advisory Committee?

A.—None that I know of.

Sir M. Visvesvaraya.—Well, this is important.

Mr. Billimoria.—I find that there was not a single engineer on the Advisory Board?

A.—What does it matter? We know that vast schemes are often handled by men who have no engineering knowledge, but whose business capacity is certainly most useful.

Sir M. Visvesvaraya.—There was no advice about any of the estimates?

A.—No estimates were placed before the advisory committee.

Q.—What were the sort of matters that were placed before the advisory committee?

A.—I could not tell not being a member of the Advisory Board, but I should imagine, precious little.

Mr. Billimoria.—What would be the function of the Advisory Committee? You expect the estimates to be submitted to them and their function would be to advise.

A.—The functions of the Advisory Board, theoretically speaking would be to advise on all matters pertaining to the activities of the department of which they were the advisory committee. I don't say that means really that their advice should be accepted, but I do say that they have a right to be consulted on *every* aspect of the department's activities.

Q.—In your opinion, the non-submission of the estimates to the advisory committee was a great mistake on the part of the Government. Do you suggest that?

A.—Yes, I certainly suggest that.

Q.—Would Government have been wiser for submitting the estimates to the advisory board.

A.—I think they would have been.

Q.—Because of the constitution of advisory board as it consisted of business men?

A.—Because there were business men on the Board, and in any case there were fresh minds on the Board not altogether wrapped up in the speedy execution of the scheme.

Mr. Horniman.—And exempt from bias.

Q.—Why was there no engineer on the advisory board who could have advised Government as to the project?

Mr. B. G. Horniman.—Because they did'nt want any.

Mr. Mody.—I look at it not merely from the engineering or technical aspect of the question; experience shows that vast schemes are handled by men who have no engineering knowledge themselves but whose advice has been found most useful. As a matter of fact we are laymen in the Corporation, and yet we handle large projects.

Sir M. Visvesvaraya.—If there were prominent business men on the advisory committee their advice would have been useful?

A.—Certainly.

Sir M. Visvesvaraya.—Then again you say "Even worse than the mismanagement of the department has been the way in which it has continually sought to mislead the public until exposure became inevitable"?

A.—Yes.

Q.—You say they tried to mislead the public; probably you mean they withheld information from the public?

A.—That is misleading if they deliberately withheld information which they thought would be very inconvenient to give out.

Q.—They may be matters of policy which Government have to decide. The department has only to carry out the orders of Government.

A.—Without entering into any considerable details, I would refer you to the evidence given by Sir Lawless Hepper himself; in answer to Sir Frederick Hopkinson, Member of your Committee, Sir Lawless Hepper admitted that there were large omissions in his report.

Q.—Yes; he did.

A.—He said that he conveyed all the information to the Government, and when tackled further on the point by Mr. Billimoria he readily admitted like a gentleman that his reports did contain material omissions. In the minority report of the sub-committee, there is a statement about what Sir Lawless Hepper said in 1925 (page 8 of the Advisory Committee report). "In February 1925, he (Sir Lawless Hepper) assured Mr. Baptista on the eve of the *interim* report that all was well and this assurance was conveyed in the report in these terms." These are the actual words: "In regard to the possibility of financial loss the expenditure has up to date approximated closely with the forecast, the total including interest charges up to 31st March 1924 being Rs. 412 lakhs against the forecasted figure of Rs. 421 lakhs." Now this is the comment of the minority report on the statement. "This obviously meant that the work done kept pace with the money spent according to programme." Now, Sir, it was no use making a statement that the expenditure had approximated closely with the forecast, when there was this cardinal factor that the work accomplished was nothing like the estimated output.

Sir M. Visvesvaraya.—Then you proceed to say "What is even more regrettable is that the Government were quietly looking on while the Department was deluding the public and from time to time themselves attempted to throw dust in the eyes of the public." Is that not a very strong statement?

A.—I admit it is a very strong statement; but it has not been made without justification. I am very sorry to have to make this statement, but facts must be faced.

Q.—Government might not have been correctly informed?

A.—Sir Lawless Hepper in his statement said that he conveyed all the information to Government.

Q.—He said that they might not have been correctly informed on the larger aspects of the question?

A.—Let Government say that they were not correctly informed; so far as the evidence has gone at present—that is, before you—Sir Lawless has stated that he informed Government from time to time and his duty there ended. I do not wish to make a point of it, but I regard the various statements made in the Council—if you desire me to go into those.

Q.—Have you got any specific instances?

A.—One of these was recently mentioned in the Council by Sir Leslie Hudson when he referred the member in charge to a question which was asked in the Council in August 1925. The question was "Will Government be pleased to state whether it is a fact that this process of dry dredging has hitherto proved a complete failure?" The answer was "No." This was made a point of by Sir Leslie Hudson who also—it is in the Council proceedings—charged Government with misleading the public.

Q.—That may be the case, because the dredging was being improved from month to month; it was experimental at first. I am merely putting the opposite side

A.—I venture to differ from you.

Q.—What date is that?

A.—August 1925.

Q.—I am just putting the other side of the case?

A.—Quite right; but I am putting my case. What I say is Government had or ought to have had the results of the dredging of two seasons. And whatever might have been said by Sir George Buchanan about the inadvisability of placing undue stress on what was achieved during the first season, there was the second season in which, according to the figures, the dredger did even worse. Then there was also a statement of Messrs. Meik and Buchanan—I read it yesterday or the day before—dated 23rd July 1924 in which it was stated that at the rate at which the dredging was going on it would take 35 years to complete the scheme. And in any case, Sir, even Sir George Buchanan, when in December 1924 he advised the Government to await the next dredging season and not to come to a hasty conclusion about the matter, even then he said, "I think it is safe to assume that we shall not get the full output of 2,000 cubic yards per hour, and that fact must be faced. If we get two-thirds of the total output we shall be doing well, but naturally the time required to complete the work and the cost of pumping will be increased." That statement at least goes to show that whatever was expected of the dredger in the subsequent seasons, the dredger was not expected by the principal man concerned in its ordering and working to go beyond two-thirds of its estimated capacity.

Sir M. Visvesvaraya—That is true; but it is improving from season to season and there were some mistakes made in the beginning which he admitted. In the second season they threw the stuff into the basin and all escaped into the sea through the foundations of the sea wall.

A.—Is it possible for Government to say that the dredging so far as it had gone was not a complete failure. The crux of the situation was dredging, and for one reason or another, either the silt or clay not being available or because there was not a competent staff to look after it or because it could not be worked with three shifts or because some of the stuff put into the reclaimed area escaped for one reason or another, the dredger had failed; therefore a categorical denial of this character was certainly not justified. I also want to refer you in this connexion to the fact that in March 1925 the Member in charge, at the end of his speech on the Budget, said, "I leave this Budget in the hands of the House, with the full confidence that it will find reasons for satisfaction in this year's administration of the Development Department."

Sir Frederick Hopkinson.—Has this Committee anything whatever to do with the Government not consulting the Corporation of the City of Bombay as to the progress? We are here to enquire into the origin and conduct of the scheme.

A.—I am not concerned with that; you are asking me questions and I am answering them wherever I can answer. I am not volunteering any statement of my own.

Sir Frederick Hopkinson.—Has this Committee anything whatever to do with the Government not consulting the Corporation or anybody of the city of Bombay? We are to enquire into the inception and the conduct of the carrying out of the scheme.

A.—*Mr. Mody.*—Well, Sir, I am not concerned with the view you take of the functions of your Committee. I am only answering questions put by the Committee. I am not volunteering any statement of my own. We have given evidence to corroborate the statements we have made. The best thing I can suggest is that you ask us to deal with only so much of the representation as you think relevant, and the rest of it may be cut out.

Mr. Horniman.—Because I understand this Committee is to enquire into the inception and the conduct and the responsibility of the scheme, we say that if public representative bodies like the Bombay Corporation, which is in charge of the Government of

the city, had been consulted properly, it is possible and probable that the disaster would not have occurred. We are here to give evidence. We shall give whatever evidence we are asked to give.

Q.—We cannot possibly deal with it as it is outside the terms of reference.

A.—*Mr. Mody.*—I am prepared to take that from you. It is up to you to say whether it is outside the terms of reference of the Committee or not. I shall say no more about it.

Mr. Horniman.—It is very interesting to hear the explanation which the Honourable Member in charge gave in the Council, that it had not proved a complete failure. He admitted that the answer was drafted a day after he had the Chief Engineer's report of a very unsatisfactory character. The reason was given that the Chief Engineer's statement had to be submitted to the Committee.

Sir M. Visvesvaraya.—You say, "No condemnation can be too severe for a proceeding of this character and the Corporation hope that the Back Bay Enquiry Committee will take strong notice of the method in which the public has been deceived in connection with the scheme." Isn't that very strong?

A.—*Mr. Mody.*—It may be couched a bit strongly, but it is a statement of facts and we can substantiate it.

Q.—The work is a very big one. Had the dredgers proved successful, it is probable that you would not have had any complaint to make, and if the work had proved profitable, you would have pocketed it and said nothing.

A.—Very likely.

Q.—So you have got to bear in mind that aspect too.

A.—When a thing goes wrong there is always somebody to find fault with. The dredgers had proved a failure; the estimates went up owing to the failure. Is it not reasonable to suppose that the Government would take the public into their confidence fully and that they would not deceive and mislead them. There is nothing to show in the "Reports on the Working of the Development Department" that they met with very serious failures in those two seasons. With reference to Sir Frederick Hopkinson's objection, I may say that we put in this statement because of the assurance that this Committee would enquire fully into the working of the scheme. Public bodies like the Bombay Corporation had asked categorically that the whole of the Back Bay muddle should be enquired into and the persons found responsible dealt with in a suitable manner. On that assumption we put in this statement. We also considered that the terms of reference were of the widest character.

Mr. Billimoria.—We do want the facts as far as any charges that you can lay at the door of any person or party concerned. But what we want is details. So far there are no specific charges against anybody.

A.—In support of my statement, I have given you data, I have given you figures, I have given you quotations, and I am prepared to give you any number of additional facts and figures if you want them.

Q.—You ought not to carry away any impression that we want to shut out any evidence. We want some definite facts or data on which we can come to a conclusion when we are making our recommendations to the Government.

A.—It is up to you to ask what you want.

Sir M. Visvesvaraya.—You know that the Development Directorate authorities say that they have not exceeded the estimates under any head except dredging?

A.—That is so, I have seen that.

Q.—The failure of the dredger is answerable for the whole blame?

A.—Very largely.

Q.—That may be their misfortune and not their fault.

A.—I hope so, for their sake.

Mr. Horniman.—We think it is a fault.

Q.—Particularly because some of the specifications were not——

Mr. Mody.—Proper investigations were not carried out before the dredger was ordered.

Q.—You say "it is suggested that tenders should be invited for the work to be let out on contract at a reasonable and definite figure to some firm of repute and strong financial position." How can this be done with dredging?

A.—If the idea is to dry-fill instead of dredge, then I suggest the advisability of inviting tenders so that you may limit your liabilities. In any case, you know exactly where you stand and can provide against future uncertainties. Besides, you then have a definite assurance that, so far as the public is concerned, the work is going to cost you a certain figure.

Q.—You say that it might be well argued that the Government of India are partly responsible for the financial disaster which has overtaken the Presidency. I suppose you want constitutional checks for that ?

A.—I want reparation for the past.

Q.—They were not consulted about the revised estimate.

A.—*Mr. Horniman.*—The Government of India were sanctioning loans and making advances to the Government of Bombay to carry out the work. They should have made enquiries as to how the estimates were going up and should have exercised some check.

Mr. Mody.—I go a little further than that and say that the Government of India, in view of their pronounced views about the Back Bay Reclamation, should not have given a *carte blanche* to Sir George Lloyd, and should not have accorded their sanction to the scheme in the desperate hurry in which it was given.

Q.—It must be remembered it was a boom period and the Government would not have wished to be left behind.

A.—That might have been so, but at the same time there should have been some control over the scheme.

Sir Frederick Hopkinson.—All the papers show how the Government of India were reluctant to consent to the scheme for years. It was only left to the Bombay Government to carry out the scheme and not to the Government of India.

A.—*Mr. Mody.*—My point is this ; for years together the Government of India were extremely reluctant to countenance any Back Bay Reclamation. But when this particular scheme emerged and Sir George Lloyd pushed it forward, then the Government of India, in view of the fact that previously they would not sanction even a modified scheme of 220 acres, should have hesitated before they sanctioned a scheme of 1,150 acres,

Sir Frederick Hopkinson.—Which Government do you blame?

A.—Primarily the Bombay Government.

Q.—Do you blame the Government of India for the carrying out of the scheme?

A.—Not one bit.

Q.—Only for approving it?

A.—I am trying to make out a case for getting a little money out of the Government of India.

Sir M. Visvesvaraya.—You are very impartial and blame both?

A.—Yes, I am very, very impartial and blame both. The Corporation did not charge the Government of India with anything more than carelessness in respect of approval of the scheme. All that we say is that here is a fair case made out for relieving the Provincial finances, because, if the Government of India had looked more closely into things, when they sanctioned those loans and advances, such a state of things would not have come about.

Q.—Really they are not to blame?

A.—They should have intervened when the 367 lakhs was increased to 702 lakhs.

Q.—You mean they ought to have intervened ? May I correct you ? You know that under the Reforms His Excellency the Governor of Bombay had all the full powers and the Government of India had no right of interference.

A.—I know that.

Q.—And when the estimate was increased to 702 lakhs it was sanctioned by the Government under the Reforms.

A.—It was not sanctioned by anybody, as a matter of fact, but the Government of Bombay. They did not refer to the Government of India or to anybody else.

Q.—It was sanctioned in October 1922 by the Bombay Government.

A.—But much previous to that, in 1921, Sir George Lloyd announced at a meeting he had with the Indian Merchants' Chamber that the estimates had gone up to 702 lakhs.

Q.—With regard to the question of liability and responsibility of the Government of India that you raised, the Government of India could not have come in there under the Reforms, because the powers were vested in His Excellency the Governor in Council. How could the Government of India intervene?

A.—Considerable loans were raised by the Government of Bombay, and the latter had to get the sanction of the Government of India for financing this project, and I submit that there was a case for intervention by the Government of India. The Government of India should certainly have asked the Bombay Government to look more closely into the scheme.

Q.—Is there anything to show that they did not?

A.—I have no evidence that they did.

Q —If you have no evidence what is the good of saying it?

A.—I have not got access to Government dispatches. There is nothing on record however to show that the Government of India at any stage after the sanction put in any word of protest or warning.

Q.—But, according to Mr. Billimoria, the Bombay Government was independent?

A. Yes, but the Government of India were sanctioning loans and advances, and when making them they ought to have seen how the money was being spent, well-spent or not, and we contend that the Government of India should have made some enquiries into the extraordinary way in which these estimates went up. We want evidence to show that it was done. In the absence of that, we would blame the Government of India. The

Corporation do not charge the Government of India with anything very serious. All that we say is that there is a good case made out for relieving the Provincial finances. If they had exercised more scrutiny it is very probable that this disaster would not have happened.

Mr. Billimoria.—With regard to the point raised by Mr. Hornimah, I may say that the Government of India, while making the loans and advances, did not definitely make any advance in connection with the Back Bay Scheme. That was in connection with the Scheme for the Greater Bombay and it was not specified as to how many crores were required for the Reclamation. That is why the Government of India merely sanctioned advances.

Mr. Mody.—It included the Back Bay also, but the point is that at the time the estimates went up the Government of India should have intervened.

Q.—When advances were made they were made generally to the whole Presidency.

A.—Yes.

Sir M. Visvesvaraya.—Probably the Government of Bombay thought that the Municipal Corporation were not directly concerned in the scheme, because it was being financed from Provincial funds.

A.—The advertisements which were broadcasted in those days said the money was to be spent by Bombay, for Bombay and in Bombay. Speaking as a member of the Mill Owners' Association, I say that they are getting from us at least 10 lakhs a year and they are getting from the rest of the Cotton trade, another 25 lakhs. Bombay is contributing substantially to these schemes of Development.

Q.—Not the Corporation?

A.—They are contributing to the improvement of the City.

Q.—If the dredger had worked all right nobody would have said anything and probably the work would have been completed. At the same time, the increase of estimate was an extraordinary event?

A.—Yes.

Q.—From the investigations we have made if the work had been done by moorum filling only, that is, earth filling, it might have been done cheaper than 7 crores.

A.—Perhaps, yes. The Government were certainly told by the Indian Merchants' Chamber that the work should be let out on contract. That aspect does not seem to have received attention at that time.

Q.—What was the object of the Government in starting the work? Is it a productive public work or was it needed by the public or was it that a Government House was required or demanded by the business of the city?

A.—The conditions about the time the scheme was conceived were such that it was felt that there was no room for expansion so far as the business quarters were concerned. There was a considerable congestion in the Fort, public buildings and Government offices required more spacious accommodation, and it was generally felt, at least by the authorities, and not without some justification, that more room was needed.

Q.—It was a boom period?

A.—It was.

Q.—In some of the communications it is stated that the Bombay Government wrote to the Government of India that there was a danger arising from discontent if the scheme was not sanctioned.

A.—I have not noticed that. So far as the housing of the workmen was concerned I must say that the scheme was largely in response to public opinion. I want to make our attitude clear. In spite of the fact that the Housing Scheme has also been a gross failure in many of its aspects, so far as the housing of workmen was concerned the Government were right in undertaking it. But so far as the Back Bay Reclamation was concerned, in spite of the fact that it was a boom period, many people and important public bodies warned the Government and told them that development was not wanted here; I will refer to the statement of the Indian Merchants' Chamber. In 1921 they said that the Back Bay Reclamation was not required.

Q.—There was a public demand for it?

A.—No, not from any quarter.

Q.—It was passed unanimously in the Council?

A.—Yes.

Q.—Coming to the future working of the scheme, you state that the Development Directorate as at present constituted should not be allowed to carry on the scheme any further towards completion. If that is your view, whom would you substitute in its place?

A.—We do not want to substitute any other agency for the carrying on to the completion of this project for the simple reason that it would disturb the organisation very considerably.

Q.—The question of the P.W.D., taking it over has been suggested?

A.—I do not agree with it for this reason that the Public Works Department however efficient has its hands full, and short of a reorganisation it could not straightaway get hold fo this scheme and run it.

Q.—The fact that it has control on a department does not mean that it cannot undertake the scheme. A Chief Engineer will be appointed.

A.—My point is that there is no real necessity for the change. The agency is there. It should be properly controlled.

Q.—Would you also recommend a Committee of the type of the Port Trust?

A.—Yes.

Q.—You want to maintain a separate department or form part of the existing department?

A.—So far as the Directorate is concerned we want to continue it until this work is finished?

Q.—And you want this to be treated as a transferred subject?

A.—Yes. Our suggestion is that the Advisory Committee should have powers of effective control at every stage. If you can constitute a Committee of this character without any needless delay I certainly would recommend it.

Q.—How many members would you have on the Executive Committee?

A.—I am not particular about the number. About 9 or 10 members or a dozon.

Q.—What bodies to be represented?

A.—I suggest the Bombay Corporation, the Legislative Council, the Mill Owners' Association, the Indian Merchants' Chamber and the Bombay Chamber of Commerce, a representative, if you like, of the labouring classes also.

Q.—You say, "It must be remembered in this connection that the Government of India's sanction was obtained on an original estimate of 4 crores of rupees, which was doubled within a very short time and yet the Government of India do not seem to have worried over the financial prospects of the scheme." You say, "it is submitted that it would be unfair that the Military Authorities should be presented with a large area of land in the best part of Bombay at a figure much under the ultimate cost of the undertaking." Will you get a purchaser for such a large area of land if you refuse their offer? You want a higher rate?

A.—I would not be prepared to take that risk. I am putting it forward as a fair proposition.

Q.—Has the Municipality been consulted as regards the lay out of the new area of 1,145 acres?

A.—I cannot say. I think that all public bodies were sent a plan of the new area, and to our amazement we found the Municipal buildings figuring on the Reclamation though none of us knew that it was ever intended to change our present habitat.

Q.—Originally the Government House was there?

A.—Yes.

Q.—*Sir Visvesvaraya.*—Mr. Mody, has the Municipal Corporation been consulted by the Development Directorate about the 1,145 acres?

A.—I am not sure, but I think all public bodies were sent some plans and it was then we saw the Municipal Corporation Building figuring on the Back Bay Reclamation, though we never knew of it.

Q.—How much of the area would you set apart for building purposes leaving out the part taken by the Military Department?

A.—I would provide a fairly large amount of room for open sites and roads.

Q.—Is the Municipality going to contribute towards the cost of the work?

A.—No Sir.

Q.—And why not?

A.—For the simple reason that if we had the money we would rather take up the congested areas in the city and provide much needed open spaces.

Q.—In the case of open spaces in the City, does the Corporation pay for them?

A.—When an open space belongs to the Corporation they pay for it; but when it belongs to the Government, the Corporation do not pay for it.

The Corporation directly pay nothing for the scheme, but it represents the millions whose pockets are touched.

Q.—Of course the pockets of the whole presidency are touched?

A.—But Bombay's primarily. The contribution of Bombay to the Provincial finances is overwhelming.

Q.—On the area of 1,145 acres would you like to have public buildings or residental area? Would you like to remove some public buildings there?

A.—I think some of them might go there, but there are no definite proposals for such removal.

Q.—As regards the completion of the project I understand No. 8 is nearing completion and No. 1 is partly completed, others have not been begun yet. From the information you have from the reports of the Sub-Committee what is your view? Would you leave it absolutely incomplete or partly complete?

A.—It all depends on the reports of the Committees which are sitting at present but from the data which are available at preseent I would say that it might appear desirable that Plot No. 8 should be completed because there is a ready purchaser and because it is nearing completion but I would like certainly to see the figures of the additional cost that would be incurred in connection therewith.

Q.—When the whole thing is completed and the building sites area available for sale, what rate do you think would be obtained?

A.—It's an extremely difficult question to answer; it all depends on the circumstances, but at the present moment the values would be between Rs. 30 and 50 a square yard.

Q.—The total area reclaimed comes to about 55 lakhs of square yards or 1,145 acres; out of that 5 lakhs square yards have been completed or nearly completed when No. 8 is finished and there will be 40 lakhs of square yards and out of 40 lakhs it is proposed to provide 22 lakhs

square yards for buildings, now these 22 lakhs of square yard set apart for building purposes might fetch about Rs. 40 per square yard, and if the same be reclaimed at Rs. 10 per square yard, would you complete the whole scheme or would you leave it incomplete?

A.—It's a question which must be viewed from all points. The financial condition and the period required to dispose of the land must be considered.

Q.—*Sir Frederick Hopkinson.*—Is the Bombay Municipal Corporation paying something towards the completion of the scheme? Why should they have a voice in this scheme?

A.—Because the Bombay Municipal Corporation is a Local Self-Governing body and it has a vital interest in the expansion of the city. When the City Impovement Trust was started, it was one of the blackest periods in the history of Bombay, but even then the feeling was that there should not be a separate body.

Q.—If the Corporation is paying nothing for the scheme why should they have any control or management of the scheme? Or why should they have any share in it?

A.—Because the Corporation is intimately concerned with everything that touches the welfare of the population.

Q.—It seems to me that the shortest way out of the difficulty was for the Government to say: if you want responsibility you share half the expense. Would it settle the difficulty?

A.—It would settle your difficulty but not ours.

Q.—You said in the afternoon that this scheme should be carried out under the guidance of the Bombay Corporation. Has the Bombay Corporation any members who are especially experienced in works of this kind? Has it got any one?

A.—Nobody is especially experienced, except Mr. Arbuthnot.

Q.—Would you then have a member of your Corporation on a Committee who has no experience of this work?

A.—Not always.

Q.—Then whom would you appoint on an Advisory Committee from the Corporation?

A.—There are businessmen who would deal with the business side of the problem and see whether the work is properly done or not.

Q.—That's a question of policy but what about the question of work?

A.—Certainly very many questions of policies can be dealt with by businessmen apart from the engineering skill required for the job.

Q.—Supposing you would let out by contract you cannot alter that contract?

A.—That's another matter altogether. If you understand what I really mean, the businessmen on the Advisory Committee would have scrutinized the whole thing very closely when the estimates went up from 367 to 702 lakhs.

Q.—Did the Corporation ever object to the construction of this work when it was at its first inception in 1919?

A.—The thing was not made public till 1920 but people were talking about it in 1919, and I think in the latter half of 1920 it was known that there did exist such a scheme.

Q.—Did the Corporation then object to the scheme being carried out?

A.—It was never brought before us.

Sir Frederick Hopkinson.—They were satisfied that it should be carried on?

Mr. Mody.—The position both as regards the Corporation and every other public body was this that they were coerced into silence because there was a masterful man at the helm of affairs who was absolutely confident of the success of the scheme and because conditions were quite abnormal. Just as in 1897 the Corporation allowed the constitution of the Improvement Trust without any violent opposition they allowed this Development scheme to be pushed through without strenuous objection.

Q.—Did not the Corporation see that if the reclamation were carried out it would increase the rateable value of landed property.

A.—Yes.

Q.—So it is not surprising than they did not object?

A.—No not from that point of view.

Q.—Your statement assumes from the commencement to its close that the whole thing is a ghastly failure; you have not waited until we have had an opportunity of forming an opinion.

A.—We are anxiously awaiting the reports of the various Committees.

Q.—It was generally stated that the profits on the schemes would be something like Rs. 50 crores. So you took the risk.

A.—Pardon me, Sir, we took no risk whatever. In 1921 Sir George Lloyd proclaimed to the world most emphatically that it was a very simple business and that he was very confident about it. He stated that is was an extremely easy proposition to reclaim the foreshore and that many of the businesses in Bombay could not possibly be compared with it as regards the ease with which it could be accomplished.

Sir Frederick Hopkinson.—Shortly you were prepared to share the profits but were not prepared to share the loss.

Mr. Mody.—Well, if the Bombay Corporation had made a similar muddle they would have received the same treatment.

Sir M. Visvesvaraya.—Then it is a misfortune.

A.—Yes, it is a misfortune all round!

Sir Frederick Hopkinson.—If the facts turned out to be different would you revise your opinion?

A.—Very possibly. After all, Sir, we are reasonable men, even though we are members of the Corporation!

Sir Frederick Hopkinson.—You say that is would be unfair that the Military authorities should be presented with a large area of land in the best part of Bombay at a figure much under the ultimate cost of the undertaking. It is a very desirable locality as regards value of land?

Mr. Mody.—Not from the material point of view because it is away from the business centre. But considering its amenities as a residential area it is one of the best parts of Bombay.

Q.—Do you think it is reasonable to ask the Military authorities to revise the agreement? You have made a bargain to supply a certain area of land at a certain price.

A.—We are not saying that we are legally entitled to it.

Q.—Why do you ask for it?

A.—The way I would put it is that I would go to the Military authorities and say "we reclaimed the land on the understanding that we would be able to supply a portion to you and make a little profit over it according to our estimates. But the figures have gone all wrong and we ask you if you would reconsider the question of the price."

Mr. Horniman.—It is not an uncommon thing in connection with the Improvement Trust contracts. People who have taken leases of the Trust land come to the Trust if they are in difficulties and ask for some concession or revision.

Sir Frederick Hopkinson.—You say that the Military authorities are taking a large area of land in the best part of Bombay at a figure much under the ultimate cost of the undertaking. What figures have you got in support of that statement? I suggest that the Military are paying much more than they ought to pay. The total area was 1,145 acres which was to cost Rs. 367 lakhs. Now the Military are paying half of that amout for one-fifth of the total area.

Mr. Mody.—If you look at it in that way then I would say that the public will be paying you even more when you sell them land at Rs. 30 and Rs. 40 per square yard.

Sir Frederick Hopkinson.—I am trying to show you that the Military are paying you much more than the actual cost.

Mr. Mody.—I am trying to show you that if they are paying less than the cost, it is reasonable to ask them to reconsider the question of the price. If you say that the 265 acres which the Military have agreed to purchase will cost the Bombay Government something less than the Military will pay for it, then I have no case for asking for a reconsideration. My suggestion is based on the assumption that the ultimate cost of the 265 acres will not be recovered from the Military authorities.

Sir Frederick Hopkinson.—Now coming to the point where you state: "It might well be argued that the Government of India are partly responsible for the financial disaster which has overtaken Bombay, by the light-hearted manner in which they accorded their approval to the scheme which had been turned down repeatedly by competent opinion for more than a decade." Can you give us any facts about that? All the papers I have seen go to show that the Government of India was extremely reluctant to agree to this scheme. It was only on the insistence of the Bombay Government that they ultimately agreed to it?

Mr. Mody.—That is not the point I have brought forward.

Q.—Then about the "light-hearted manner in which they accorded their approval although it had been turned down repeatedly by competent opinion"?

A.—I must make this point clear. What we meant is that the Government of India who prior to this had all along taken up an attitude of extreme caution and discouraged all the venturesome projects of the Bombay Government, agreed light heartedly and waived all objections and allowed the Bombay Government to do what it liked when the present scheme was put up.

Q.—It did so because, so far as I understand, everybody in Bombay was delighted to start because they were going to make a solid profit on it amounting to as much as 50 crores.

Mr. Horniman.—If you turn up the files of the *Bombay Chronicle* at that time you will find that it was strongly dissenting about it.

Q.—Does it not go to show that the *Bombay Chronicle* does not represent the public opinion. It was everybody's opinion in Bombay that they were delighted to go on with this scheme.

Mr. Mody.—I dispute that entirely.

Sir M. Visvesvaraya.—Were the Indian Merchants' Chamber in favour or against the Scheme?

A.—Emphatically against it. They protested from the very beginning and all the way through. It is not correct to say that public opinion was unanimous or even overwhelmingly in favour of the scheme.

Mr. Horniman.—In the proceedings of their confidential meeting which were not published (I have not got the date of that) they protested very strongly against it. Even when the scheme had proceeded, I mean in 1921, they also protested and said that the scheme was not wanted.

Sir Frederick Hopkinson.—Is it the intention of the Bombay Government to recover from the Bombay Corporation any amount towards the open spaces?

Mr. Mody.—I do not think so. The Improvement Trust never asked us for any payment for open spaces provided by them.

Mr. Billimoria.—Mr. Mody, you are here, I take it, as a representative of the Bombay Corporation and not in your individual capacity?

A.—I represent the Bombay Corporation.

Q.—In the written statement which you have submitted to us you say: "the reckless manner in which the scheme was launched by Government." That is a very harsh expression against the Government. Have you got anything definite to say in what manner the scheme was recklessly launched by the Government?

A.—It is amply proved in evidence that has been given before your Committee that nobody was consulted. I think it was Sir Frederick Hopkinson's question ; "was any expert in the world of any sort consulted," the answer was, "No."

Q.—That is what you refer to?

A.—That is not all. The dredger was ordered long before even the scheme was made public, let alone the execution of the scheme. The dredger was decided upon as early as May 1920, that is, when the scheme had not been decided upon, and the Government of Bombay asked the Government of India's sanction for the dredger in anticipation of the Secretary of State's sanction. These are just two points. There are a great many more.

No borings were taken of any sort and it means they must have relied on the borings made at an earlier period by Messrs. Lowther and Kidd. The most glaring instance was about dredging from a certain area without ascertaining,—which was so easy to do,—from the Port Trust whether that area was available, and that upset the calculations of Sir George Buchanan a great deal. This obliged them to resort, if I am not mistaken, to reclamation from the Back Bay. Then another point is that dredgers were bought without taking the least trouble to find out what they were capable of doing. Here are the Port Trust authorities who had a very long experience but they were not consulted. Without consulting public opinion one particular man is fished out to advise Government, no other man is called in, and everything hinges upon the opinion of one expert. A definite plan is decided upon when the scheme has not even been made public. If that is not recklessness what is recklessness?

Mr. Billimoria.—With reference to this ground, I think it would interest you to know a short history of the scheme. It was in 1907 during the period of Lord Lamington's Government that a Committee was appointed to consider the reclamation scheme which had been prepared in the Secretariat for an area of 1,973 acres costing 167 lakhs, which was subsequently increased to 320 lakhs. The Government of Lord Sydenham urged that the scheme was a productive public work of the highest utility. The Government who were hesitating greatly, agreed to give their approval to the scheme. It was also informally agreed that should it eventually be decided as a result of this Committee's report that the scheme of reclamation in the Back Bay was desirable, a beginning might be made in this direction. Then Mr. Kidd was asked to prepare and submit an estimate. He submitted an estimate. He submitted an estimate for 1,145 acres in the Back Bay costing 325 lakhs.

Mr. Mody.—What year was that?

Mr. Billimoria.—That was in 1912.

I am giving you a brief history in answer to your charge of reckless manner in which the scheme was launched. Then the Committee's recommendations were as follows. "If the reclamation is practicable as they believe it to be, it should be undertaken immediately in order to prevent the possibility of such a contingency arising. The strongest point in favour of the reclamation being taken up immediately, is that Government will be able to provide a large area of land for residential purposes near business quarters at a reasonable rate." Then the conclusions at which the Committee arrived at are : "In conclusion we wish to lay stress on the fact that the scheme is not only financially sound but that it adds to the beauty of the City and will after some years add considerably to the resources at the disposal of the Improvement Trust in its efforts to reclaim insanitary areas."

Mr. Mody.—Is that a unanimous report?

Mr. Billimoria.—There does not seem to be any dissentients. Again in December 1917, before the scheme was launched, a very powerful syndicate was formed in Bombay consisting of the late Sir Shapurji Bharucha, Kt., Mr. (now Sir) Lallubhai Samaldas, the late Sir Vithaldas Thakersay, Kt., Sir Sassoon David, Bart., and Sir Fazalbhoy Currimbhoy, Kt., and addressed the Government on the subject of the Back Bay Reclamation Scheme and asked for concessions. Shortly after that Sir George Lloyd succeeded Lord Willingdon as Governor of Bombay on the 16th of December, so that when this scheme was launched, long before that, ever since 1907 from Lord Lamington's Government, there were various proposals before the Government that the scheme was going to be a productive one. Even, as far back as 1913, the Government of Bombay appointed a Committee whose report has since been published, and I find on page 25 of that report some comments made by you or written statements by you before that Committee. That is dated 27th of November 1913. I find that in your written statement you have expressed views different from those conclusions which the Committee arrived at. In order to do you justice I will read some portions "I may state at once that I am altogether opposed to any scheme for reclaiming the foreshore of Bombay as ample land is available within the present limits of the city." You go on "it has not been financially a sound proposition."

Mr. Mody.—I will give you another extract from my Statement of 1913 :

"Another objection to the scheme is on the score of its not being a financially sound proposition. There are reasons for apprehending that the official estimates of the cost of the undertaking and the area of land which is expected to be taken up annually by the public are unduly optimistic, and in view of the notorious uncertainty attaching to all schemes of reclamation this aspect of the question must be carefully examined."

Mr. Billimoria.—That is the opinion that you expressed before the Committee.

Mr. Mody.—Yes.

Mr. Billimoria.—In spite of the fact that the Committee's conclusions arrived at were strongly in favour of the reclamation of Back Bay.

Mr. Mody.—I do not know if that was a unanimous report.

Mr. Billimoria.—Do you still adhere to the opinion that you expressed in 1913?

A.—Yes, with this exception that if at any time, whether now or hereafter, it is possible to reclaim 1,150 acres at a cost of 367 lakhs, I might be disposed to say that it is not altogether a bad proposition ; but my point is that the thing cannot be done. You just now read a report of 1912 which stated that at a cost of 325 lakhs it was estimated that an area

of 1,125 acres could be reclaimed. These are practically the same figures which were finally decided upon in the estimates of 1920; that means that between 1912 and 1920 no account whatsoever has been taken of the rise in the cost of living, in the cost of material and labour which had taken place, let alone the accuracy of the original figures.

Sir Frederick Hopkinson.—That has already been brought out by the Committee.

Mr. Billimoria.—After having gone on with the scheme since 1907 would you still call it that Government have been reckless?

A.—Merely cogitating over the scheme and considering it year after year does not absolve the Government from the charge that they launched it recklessly. Recklessness would come in in the way in which the final estimates were prepared, in the way in which they were finally decided upon and in the manner in which all the points had been investigated. You may consider a scheme for 50 years but if at the final stage you rush it through without taking into consideration all the data that are available, then I say you are reckless?

Q.—Will you, Mr. Mody, say whether at the time the scheme was launched, it was not considered as a very good business proposition at 367 lakhs? If it was considered a very good business proposition then it was not reckless. If it was considered a sound business proposition, you cannot accuse Government of being reckless?

A.—But the whole point is that these figures should not have been put forward. If the Government had stated a 100 lakhs, we would have said it was a still better business proposition but the question is whether you can do it with that sum. We had been told very authoritatively that the scheme had been very carefully investigated, that there was no possibility of its going wrong, that it was a very simple proposition from the engineering point of view, that they were allowing an ample margin when they allowed 10 per cent. and estimated the whole thing would cost about 4 crores.

Mr. Billimoria.—If upon that basis the area were completed and the date had not been extended, it was a business proposition; Government is not to be blamed if ultimately the figures are exceeded. When Government made that announcement, they had certain material or data before them on which they had to form an opinion. On the basis of these various reports submitted to them, they considered it was a good business proposition and they went to the public and said so?

Mr. Mody.—They did not consult anybody. They consulted only one expert and that was Sir George Buchanan. Now I remember one more point. Even the appointment of this expert was typical of the hurry with which the whole scheme was decided upon. If I remember rightly, the Secretary of State recommended some other firm,—I forget the name—and the Bombay Government could not wait for them. They wanted a man in Bombay by May 1919. They could not even afford to wait for the expert suggested. They got hold of a man whom they thought to be an expert. Was it good business to rely on one man to get out all the details of a scheme like this.

Sir Frederick Hopkinson.—Let me tell you that it is invariably the practice for one man or one firm to do the whole work.

A.—I do not know, but so far as our Corporation is concerned, we have sanctioned and carried into execution schemes worth crores of rupees. In all cases we have the estimates prepared by our own Department. These estimates are shown to our consulting engineer and the report of the consulting engineer again submitted to experts. Take this vast drainage scheme we have in hand. We have 3 of the world's best experts as advisers on it ever since 1921. I certainly admit that in all cases the first calculations must be done by one man but in a scheme of this magnitude, I certainly would not place blind reliance on the opinion of one man.

Sir Frederick Hopkinson.—It is invariably the practice.

A.—I bow to your great experience in these matters. I will not say anything more than that I was speaking of conditions in this country. May I ask if the Public Works Department is conducted on the same principle that vast schemes are undertaken without consulting experts.

Sir M. Visvesvaraya.—No engineer likes to have his plan scrutinised by another but I think the owners take the precaution of having schemes examined by other men. There is always wisdom in a multitude of counsels.

Mr. Mody.—Very often. I think it is necessary that there should be more than one expert in such cases.

Before you finish, Sir, I would like to say that if it is a charge against us that we are here merely to rake up the past, I may say that that is not the intention.

Mr. Billimoria.—We want you to rake up the past otherwise the question cannot be considered.

Mr. Mody.—If you want our concrete suggestions we have made some suggestions here. The practical suggestion is that when the reports of these various Committees are out, they should be submitted for opinion to public bodies and sufficient time given to them for consideration. So far as the Corporation is concerned, I may say, that the report will receive the most anxious consideration of the Corporation, so that it might not be said that we are merely concerning ourselves with what has been done and do not want to take a long view of things and do not want to show how the city can be rescued from this huge financial loss which has overtaken it.

Mr. Billimoria.—From your suggestion may I take it that you do not want that the work should proceed any further until the Committee's report is out?

A.—Personally, I am certainly of that opinion that until the report is out, the work should not be proceeded with further. There is a Resolution that the Corporation passed in February or March of this year that nothing should be decided about proceeding with any portion of the scheme until these various Committees which the public had asked for had made their reports, The Minority Report says "We have no confidence in the forecast that is now submitted."

Q.—Don't you think that on the huge sum of money which has already been spent on the scheme, interest will go on piling up month by month until the reports of these various

Committees are out? Would you allow the interest to pile up or would you proceed with the work to curtail the loss by making some progress?

A.—But you may progress in the wrong direction!

Q.—You do not want to leave the work incomplete or half done?

A.—When you are inviting the reports of expert Committees, certainly you ought to wait before you proceed further, in view of your past deplorable record. The impression on the mind of the public would be that you are carrying on the work before the Committees' reports are out, and that you had decided upon carrying to completion certain portions of the scheme regardless of what any Committee would say. That would be the impression left on the mind of the public.

Q.—According to your suggestion at present you do not object to block No. 8 being completed and you do not want the total abolition of the scheme?

A.— Yes, but we would like to know how much remains to be done and what it is going to cost. If the portions that remain to be done are not very much and the additional cost is something which need not frighten us, I say by all means go on with block No. 1 as well.

Q.—With regard to block No. 1, if you have seen the work that is being carried out from both ends, from one end it is dry filling and the other dredged filling, you would like it to be completed rather than leave it in the way in which it is. Don't you think that it is advisable to complete it?

A.—I think it would be, unless it is at a prohibitive cost.

Q.—With regard to other blocks you would await the results of these present undertakings and see what the land would fetch and then proceed with other blocks. Is that your suggestion?

A.—I would see what it would cost and I would watch how the land made available by the completion of block 1 is selling. I would await the result of that.

Q.—You would not recommend the prosecution of the scheme in respect of blocks 2 and 7?

A.—Nothing, not until block No. 1 has been entirely disposed of. At any rate not until 1 and 8 have been completed and we know where we stand.

Q.—By "completed" do you mean filled in, or disposed of?

A.—First of all filled in, so that we know exactly what it is going to cost to reclaim the area, and secondly, to allow a little time to elapse and see in what manner this land is being taken up by the public and what the public are prepared to pay for it.

Q.—In the meantime do you suggest the dredger should remain idle and overhead expenses run?

A.—In order to keep the dredger active I would not reclaim at a prohibitive cost; no business man would, Sir.

Q.—Then you refer to some notice of motion by Dr. Sukhia in one of the questions asked by Sir Visvesvaraya that on the 20th June 1921 he had certain views and he gave a notice of motion. In the evidence that Dr. Sukhia gave the other day before us he said he had changed his views. He is now in favour of completing the scheme.

A.—I cannot help the change of his views. He is no longer our representative, besides.

Q.—It was this gentleman who was responsible for the notice of motion, that notice of motion which you emphasise?

A.—I do not emphasise that notice of motion at all. All I say is, this is the way in which the advisory body was allowed to function, that the members were ruled out whenever they suggested anything as regards policy or details.

Q.—Then in one of your answers you have stated that in August 1925 Government made a statement that the dredgers were working satisfactorily. Will you kindly mention names as to whom you mean by "Government"?

A.—I was referring, Sir, to a question which I read out, *viz.*, "Will Government be pleased to state whether it is a fact that this process of dredging has hitherto proved a complete failure?" and the answer was "No." That was by the General Member in charge. My point is that that answer ought certainly to have been qualified in view of the fact that there was the experience of 2 dredging seasons and that in January of that same year Sir Lawless Hepper had put up the estimate to 880 lakhs. I say the answer ought certainly not to have been in that cryptic and emphatic form in which it was couched. I think I can give other instances, but I do not want to take up your time.

Q.—You said something about a public meeting held under the auspices of the Chamber in 1921. What did the Chamber then suggest or what were your views in 1921?

A.—As regards the Chamber the position was this, that public opinion, Indian commercial opinion in Bombay was getting very restive both as regards the ultimate outcome of the scheme, what it was going to cost and the veil of secrecy which had enshrouded all the activities of the Department. So the Indian Merchants' Chamber was constantly corresponding with the Government of Sir George Lloyd, and Sir George Lloyd did the Chamber the honour of according it an interview where he explained the policy of Government. Then a requisition was received from the members of the Chamber calling for a public meeting, and a very largely attended public meeting was held in the Town Hall; I had the privilege of moving the principal resolution at that meeting, which demanded that the Development Department should be a Transferred Subject. We did not want it to be a Reserved Department which the Government could manipulate in any way they liked, and we had grave doubts about the outcome of the scheme.

Q.—But you did not condemn the scheme by that resolution?

A.—Not by the resolution I moved, but there were other resolutions, and there is ample material to be found in the representations made by the Indian Merchants' Chamber.

Q.—Do you call that public opinion?

A.—I maintain the Indian Merchants' Chamber represents Indian commercial opinion very faithfully.

Sir Visvesvaraya.—You have put the Corporation's views very ably, and we thank you.

29th Witness

Mr. C. J. Hansoti

Mr. C. J. Hansoti of the Ghatkopar Municipality.

SUBSTANCE OF EVIDENCE

Inception of Back Bay Reclamation Scheme

It appears that the Scheme was not carefully considered in all its bearings and especially in its estimated cost, and financial outlook. A Scheme of such magnitude and cost should have been worked out in detail and its estimates and financial forecasts carefully prepared and cautiously considered before it was launched. Neither the expert departments of Government—the Public Works Department and the Marine—nor the Port Trust that had experience in such dredging and reclamation, appear to have been consulted. It would appear as if it was rushed through without due scrutiny.

Conduct of the Scheme

It would appear that the dredger Sir George Lloyd was either not properly and suitably designed for the work it was required to do in the Bombay Harbour or was defective in construction and did not give the expected result. It would be natural to expect that for machinery of such size and cost, proper guarantees for its suitability and performance were obtained from the manufacturers and suppliers before the order therefor was placed with them.

The dredger seems again to have been ordered out much in advance of the time it was required to commence its operations.

The construction could perhaps have, in the case, been so arranged as to get a certain length of the sea wall at the Colaba end completed as fast as possible, so that the dredger could be put to work earlier in filling some area at that end, thereby saving some of the time and money wasted by the dredger lying idle.

Future operations

Block 8 is said to be nearly completed.—Blocks 1 and 2 should be taken up if they can be filled within the cost estimated by the Sub-Committee. The rest of the work should stand over until improved conditions set in and there is a demand for land.

Sir M. Visvesvaraya.—You are residing in the suburbs?

A.—Yes.

Q.—You were Superintending Engineer in the Public Works Department?

A.—Yes, Superintending Engineer.

Q.—You were also a member of the Advisory Committee?

A.—Since December last year.

Q.—And you signed the majority report of the Sub-Committee?

A.—Yes.

Q.—You say here, " It would appear that the dredger Sir George Lloyd was either not properly and suitably designed for the work it was required to do in the Bombay Harbour or was defective in construction and did not give the expected result. It would be natural to expect that for machinery of such size and cost, proper guarantees for its suitability and performance were obtained from the manufacturers and suppliers before the order therefor was placed with them." Can you give us any further details?

A.—When machinery of that sort was ordered from any firm we would ask the firm to guarantee the performance of that machinery and that it was manufactured according to specifications and so as to be able to do the work.

Q.—You would like the plant to be tested on the spot?

A.—That would be better.

Q.—What was the cost of earth filling and moorum filling up in Bombay when you were Superintending Engineer, in the locality where reclamation is carried on now?

A.—I am afraid I cannot give the figures. It depends upon the lead, the quantity you want.

Q.—They are getting it from Kandivli and it is costing Rs. 1·57, that is, Rs. 1-9-0 per cubic yard. Is that a fair price or do you think a reduction is possible?

A.—I think it is fair.

Q.—On what aspects of the scheme are you inclined to give us your views?

A.—I do not follow you.

Q.—On what aspects of the scheme are you inclined to give an opinion? Is it about the origin of the scheme or the conduct of the scheme?

A.—I have given a sort of a general opinion.

Q.—You went through all the details about the rates. Did you not?

A.—I was not a member of the Neilson Committee and I have not gone into the rates for moorum filling and dry filling.

Q.—Have you any particular defects to point to in the present conduct of the work, and any remedies therefor to suggest?

A.—I do not know much about the method of construction adopted.

Q.—Are you satisfied that a separate department of Government should do it, or would you like it to form part of the Public Works Department?

A.—I would prefer it to form part of the Public Works Department because of the methods of procedure of work established in it.

Q.—There are lesser chances of error and better scrutiny of estimates?

A.—Yes, certainly.

Q.—It has been suggested that in future an Executive Committee should control the operations of the Department, formed of the representatives of public bodies.

A.—What technical knowledge will that Committee have?

Q.—Those bodies would put in men with knowledge of engineering, would they not?

A.—If the Committee comprise some men with technical knowledge like that, that would do.

Q.—It has been suggested that an executive Committee or Trust should be formed like the Port Trust or the Improvement Trust. Are you in favour of that or do you want the work to be administered by the Government direct?

A.—I think it should be administered by the Government direct and not by a Committee.

Q.—Do you wish the work carried out by contract or departmentally as at present. If the former, is the whole thing to be given out to a single contractor or cut up into sections and given to separate contractors? Which would be better? You have large experience of works in Bombay. You were Superintending Engineer in Bombay itself.

A.—All the same we should have the expert Department. So it would not matter if you divided the contract or gave it to one. Only the contractor should not be left to himself. There should be supervision. I will not give it to one contractor simply to do as he liked.

Q.—Now in what order would you complete the blocks?

A.—The Advisory Committee decided upon having block 8 first completed, and then 1 and 2 if the work in block 8 showed it worth while to do them. I just see from the reports that 8 is nearly completed and work is going on in No. 1. So if the cost of No. 1 shows that No. 2 can be done within the estimate by the Sub-Committee we can take up No. 2.

Q.—It is seen that No. 7 is shallower than No. 2.

A.—Yes. It is shallower but the cost is nearly the same, and the value of the land in No. 2 will be much higher than in No. 7. We were told in the Sub-Committee that the value of the land in No. 7 will be Rs. 20 whereas in No. 2 it may be anything like Rs. 80. So taking the area of land that will be reclaimed, the value of the land in No. 7 would be 1·3 crores whereas in No. 2 it will be nearly, 4 crores.

Q.—You have not considered whether it would be cheaper to carry out the work by dredging or by moorum filling, if the expenditure already incurred is ignored.

A.—I have got no figures.

Mr. Billimoria.—With regard to the future operations you have given your conclusions in your statement that block No. 8 which is nearing completion may be completed and blocks 1 and 2 should be taken up if that could be available within the cost estimated by the Sub-Committee. With regard to the rest you do not want that work to be taken in hand, but will let it to stand until conditions improve generally?

A.—Yes.

The Committee met at the Legislative Council Committee Room at 11 o'clock on Friday the 20th August 1926. Sir M. Visvesvaraya, after announcing that the Chairman was suffering from a severe attack of malaria and expressing the hope that he would be back very soon, occupied the chair

30th Witness

Mr. Hooseinbhoy Lalji, M.L.C.

Mr. Hooseinbhoy Lalji, M.L.C., and member of the Bombay Municipality, was examined.

Written Statement of Mr. Hooseinbhoy Lalji, M.L.C.

I do not wish to go into the past history of the Scheme. I would only like to draw the attention of the Committee to the opinions expressed by Officials and Non-Officials in 1913 and which have been published in the Second Ad Interim Report of the Advisory Committee (1st edition) on pages 42, 43, 44, 45 and 46 and would say that even to-day those opinions hold good. My own opinion at that time was as under :—

" I therefore simply wish to record without any comment that my views as regards the subject-matter the Committee has under its consideration and my reasons for the same will be found to be in conance with those of the majority of the non-official witnesses who have been examined or have submitted their views, for example I am opposed to Reclamation Scheme and that Building space and ground for all our needs and requirements of the present and of the near future could be supplied by :

(*a*) Utilising the Hornby Vellard and Mahim Woods.

(*b*) The doing away with the B. B. & C. I. Railway from Grant Road to Colaba.

(*c*) By removing the Cotton Green at Colaba.

(*d*) By the removal of the present Government House at Malbar Point if desired.

(*e*) By filling up all the low lying lands in Bombay and in its vicinity.

(*f*) By acquiring under the Land Acquisition, Improvement Trust or Town Planning Acts such other suitable lands as may be wanted or necessary."

There is no demand for accommodation near the Fort and specially since the Cotton Green has been removed from this locality and is now at Sewree, I am of opinion that gradually all interested in the Cotton Trade of this City will be moving towards Sewree. namely, Cotton Exporters, Cotton Brokers and Muccadums, the Mill Company's Offices and the large number of Insurance Offices as also a very large number of Mill Store Material Dealers and even the Banks will have to open their Branches there in order to give facilities to their constituents, because firstly Cotton Green is there, secondly Mills are situated near that site, thirdly because large Godowns will be available cheaper there and will be nearer to the Docks as also to the Mills, and fourthly the value of land being much less than in the Fort the rents will be cheaper. It is necessary to mention that about 30,000 people were employed in Cotton Green out of which about 10,000 people were remaining there and have now removed to Sewree.

I am further of opinion that if at all there was any justification for any reclamation scheme the same entirely disappeared as soon as it was decided that the Cotton Green was to be at Sewree and therefore those responsible for Reclamation Scheme are responsible for neglecting to appreciate this important change in the situation. The area that was occupied by the Cotton Green in Fort is a large one and the site is as healthy as any in Bombay having open sea on both the sides; I will humbly submit to the Committee to see this site if they have not already seen. This site has been lying vacant and is likely to remain so for sometime and as long as this site remains vacant there is no prospect of any Reclamation Land fetching any fair price.

I have been a Member of the Bombay Municipal Corporation for more than 12 years; I have been a member of the Rent Act Committee and I can say that there was a time when some people did feel that more accommodation was needed, but that was for lower middle class people and poor people who were living in the heart of the City and it was for that reason that the Rent Act was extended and recently it has been amended and extended making it applicable to those who pay rent of Rs. 85 and downward while all business premises have been entirely excluded. The Municipal Development Scheme at Mahim and the Improvement Trust Scheme at Matunga, King's Circle and Chawls have been more than sufficient to meet the demand. The Suburban Scheme especially Bandra, Vile Parle and Khar have also to a certain extent been useful. The Scheme at Trombay, Chembur and Ambernath have been useless and ought not to be taken in hand.

The Reclamation site would only be purchased by well-to-do people and for this class of people there has been and there is still lot of accommodation available and there has been never any scarcity felt for them. A plea has been put forward that open spaces and playing grounds and Marine Drive will be available. I ask, for whom? All the middle class and the lower middle class and the poor people live in the heart of the City, even the Maidaans are not fully availed of by them owing to their distance from their residences. Open spaces are necessary so also playing grounds but they must be in different parts of the City. The Municipality has been providing a few open spaces in the different localities for these people and Mahim Development Scheme and the King's Avenue now opened out will provide ample open space for these poor people. It must be borne in mind that the Municipality has recently spent Crores on large Schemes of Development which they have in hand in Mahim and in the Fort and a very large area of open land and land for building sites is and will be available and will be for sale sometime in the market. Besides the Improvement Trust has also spent some crores and have a very large area of open land and building land sites prepared and ready for public use and for sale on hand. Therefore there is and will be a large area of land for open spaces and for building site available for all the classes and will be specially suitable for those classes who may be said to be in need hereafter. The Municipality as also the Improvement Trust are at present suffering heavy losses on account of these lands having been on their hand and while the City is the most heavily taxed City in India it is feared that unless these bodies are able to dispose off some of their lands, fresh taxation will have to be resorted, to which will in these depressed times entirely be unbearable by the public. If this the position there can be no justification of any kind for adding more land under any plea.

As regards the work to be carried out in Plot No. 8, Plot No. 1 and No. 2, I must at once say that I am strongly of opinion that nothing should be done in Plot No. 2. I feel that if it is the intention of any one that Plot No. 3 and subsequently the whole Reclamation Scheme should be forced upon to be carried out then Plot No. 2 may be touched because if Plot No. 2 is taken up it will be necessary then to take No. 3 and so on. Plot No. 2 has a much larger area and has more deepness and will cost a great deal more. I had only recently put a question in Council whether any filling up has been done in Plot No. 2 and the reply was in the negative. I had put that question because I am sorry to say I feel there is the tendency still after all this waste of money to drag in Plot No. 2 with No. 1, with the intention of ultimately forcing the whole Scheme. I say there is no need for more area and it will be very difficult to dispose of it unless Government Offices were brought there and the present Government Offices made vacant for no earthly reason. I say this Presidency is the most heavily taxed in India and any further loan will tell very heavily on the people if any further money is to be spent on Government Offices. I hold strong opinion that there is no need for more accommodation for Government Offices. I also hold equally strong view that this area is not required for any purpose unless Government want in future a Naval Base at Bombay. To be frank I would say I feel that if there was any objective which had induced the undertaking of the whole Reclamation Scheme and which is unceivable to me and many in this city except sheer speculation then I would say it is that very objective which prompts those who are supporters of the carrying out of work in Plot No. 2 and therefore before it is taken in hand if decided to do so the reasons must be placed before the public without any reserve and the public must be given full opportunity to express their opinion on its merits because it is not the business of Government to do such things.

As to Plot No. 1 as a lot of money has been spent over it I would not object to it being finished. As to Plot No. 8 the same thing applies, but I must say here that the Government of Bombay has given this land to the Government of India on basis of its cost which were approved and sanctioned by the Government of India. If therefore there was a flaw in the cost and if the cost have exceeded it must be also borne by the Government of India. I will here also add that had not the Government of India provided the money freely and had they exercised that supervision which they usually do the local Government could not have gone on in this way. I would therefore ask that in fairness the Government of India be asked to contribute towards the cost as much more as has been incurred for the above reason and also for the reason that between the two Governments there cannot on principle be a deal which would be profitable or otherwise to one or the other because after all both the Governments are one and the same and they are not and cannot have dealings like those of a mercantile business firm.

I have also to urge that towards the total deficit the Government of India must also contribute because they are equally responsible for supervision to public and in fact the Financial Adviser was provided by the Government of India and they went on making advances which amounts to that they provided money freely for this speculative work. One thing of course I must say and that is I believe the Government of India were allured by the very large amount of Income Tax which they receive and have been receiving

from Bombay, *i.e.*, nearly six Crores out of 16 Crores for the whole of India. And they now thought that they would reap still more Income Tax if this fanciful project turned out to be so very profitable; if that is so even then as the Government of India were out for it and that was the consideration for which they supplied large sums freely I think in fairness they will write off some of their advances and reduce the load on Bombay which if it becomes little prosperous hereafter will shortly make up the amount written off by way of greater returns in the Income Tax.

Coming to the working of the Back Bay Scheme, I am of opinion that a lot of undue haste was done. The order for the George Lloyd Dredger was placed before the Scheme was even sanctioned and it is quite clear that at the persuance of the Government of Bombay, the Government of India without getting any estimates from any one allowed the Government of Bombay to contract its purchase.

The purchase of Dredger " Kalu " was also made in 1919 and in the like haste.

The proceedings of the Legislative Council, if referred to and specially of the 16th and 17th March 1926 will prove how in the exercise of its functions, the Development Department was virtually unrestrained and absolutely autocratic. The result of such working was that it ended in a dismal failure ever known in the history of any important undertaking. The public was absolutely kept in dark about its doings and was even mislead. In spite of such disastrous working of the Department, the Directorate made all sorts of glowing accounts about the working and the Government encouraged such ways of deluding the public by allowing its own officers to make re-assuring statements when they knew too well that all was not well with their department and that failure was inevitable. The public have protested emphatically against such criminal negligence of duty towards the tax-payers, and the way in which the public's money has been wasted. My submission therefore to the Inquiry Committee is that they should take a note of the ways and procedure followed by the Department throughout its existance.

The past conduct of the Department brings vividly the conclusion that it is incapable of doing the work in future and if at all any completion work is to be taken in hand it must be entrusted to one of the Transferred Departments and carried on by Public Works Department but the Committee which would be attached to it should have greater powers and should not be a mere non-functioning body as the Advisory Committee to the Department was. It must be fully representative of all the important public bodies and should have powers of effective control over the activities of the department at every stage. It is only under such safeguards that the public confidence may be restored, which may result in a reasonable prospect of retrieving the Province from financial disaster.

If however the Advisory Committee is appointed like the present Advisory Committee or for the matter of fact like the Excise Advisory Committees which are at present in existence, only in name, then as the general impression is that they cannot do any useful work it will be difficult to get the right sort of people to serve on it; therefore if an Advisory Committee is to be appointed as is very essential in this case it should be one as stated above and the Government must undertake to place all the matters before them and should not do as was the case with the present committee. The Director used to place before them only such matters as he thought fit to place. Further the members should be allowed to make public all matters that come before them except such as are of confidential nature. Sir George Lloyd in his speech while introducing the Bill had said that the Advisory Committee will have Press behind them which will make them powerful but unfortunately that has not been allowed to happen and hence I make this suggestion.

Coming to the detailed working of the scheme as far as I have been able to make out, I am of opinion that dredgers were ordered out and large quantities of stores were indented in the first instance by Sir George Lloyd as the head of the Administration without inviting any offers or estimates. Of course he did that probably at the advice of Sir George Buchanan and the whole affair was done in hot haste for which there was no justification.

The Administration of Back Bay was carried out by the Government according to the desires of Sir George Buchanan or his nominee, Mr. Lewis, for a long time, and I am of opinion that the Director of Development did not least care to bother himself with the work, except arranging for bringing down material for building Sea Wall, although he was responsible for the whole work. Of course it must be said that the Director of the Development while he did not care much for this work, kept himself pretty busy with the other works such as Chawls and Development Schemes but I regret to say which work has also not been carried out in the manner it ought to have been. The Indents made of stores were also very carelessly made; often it has been said they have been found unnecessary. The work that was carried out at Bombay and at Kandivli of loading and of unloading the waggons of rubble, murum, etc., was done in a most unsatisfactory manner. No regular tenders were invited for a long time and the rates that have been paid were much more. There was no care taken to find out reliable contractors and none of the well-known contractors of the Bombay Municipal Corporation, the Improvement Trust and

the Port Trust had been given any opportunity although it is a well-known fact that they carry out works of crores of Rupees annually for these bodies. At times tenders were invited but invariably a large number were rejected; a close scrutiny of tenders invited, tenders accepted and tenders rejected is bound to tell a sorry story of, to say the least, utter carelessness. Stores were often purchased and minor works of painting, etc., were given out without any care and there was no regular check. Cement and other articles were also sold without much care and it is doubtful whether any one was responsible as to why there was surplus and for what price such surplus was sold. One of the Contractors who carried out various kinds of Contracts for sometime was a person whose antecedents were of a very doubtful character, and this party carried out Contract to the extent of lacs of Rupees right up to April 1926 when questions were put in the Council and debates followed thereon and as a result of which he was ultimately removed.

The rates that were invariably given to the Contractors in the whole Development Department whether it was Back Bay or Chawls, have been considered by the public to be always higher to the extent of 25 to 50 per cent. I can give instances and sometimes much more than that and in many a case just under the nose of Officials, sub-contractors were carrying out the Contracts for their principals who held the contracts. It is a fact and a important fact too that the labour wages from 1920 to 1926 are the same in Bombay, *i.e.*, Re. 1 to Re. 1-1-0 to a man Cooly and As. 0-10-0 to a female Cooly and as all work that was given out mostly depended on labour wages which are the same as at present prevailing, I am sure if the rates that have been paid from 1920 right up to 1924 were compared to those of 1925 and 1926 a vast difference will be found and this has added to the heavy loss.

There were, I am told, no estimates prepared as are done by the Public Works Department, or the Municipality, nor were any enquiries ever made of the Municipality, Improvement Trust or the Port Trust as to the rates prevailing at which they were employing labour and the rates at which they were carrying their contract. The Municipality, the Improvement Trust as also the Port Trust have, thanks to the driving force of the Government of Sir George Lloyd, all been saddled with enormous Development Schemes all throughout and around the City and therefore this class of work that was going on and the class of ordinary labour that was employed by them and the general public was the same as was the labour employed on the Back Bay, the drainage work in the Back Bay and other Development Schemes. In short it has now been made out quite clear that it was never expected of the Government to do all this kind of work and what the Bombay Government have done ought never to have been allowed by the Government of India. The public were helpless because they were not only not kept informed of the true facts but misleading facts were given out which did not justify them to create more noise than what they have done. If Government is out to keep matters secret from its tax-payers none can find out all the facts. Lastly I would like to bring to the notice of the Committee the following facts as well.

It has been said that first year Dredgers were not able to work satisfactorily as the anchors sent were not as were required. Who is responsible for this? If makers, they must be made to pay. It has been said that the material in the harbour was not sufficient but in one of the Administration Reports it has been said that the second line of pipes were to be laid for Dredger " Kalu " besides that for the " George Lloyd ". This fact is very important. It is also said that Dredgers were found to be unsatisfactory since 1924. Well, it is a well-known fact that Government kept this fact very secret and even in February 1925 when Councillors were taken to see the Reclamation Work this fact was not mentioned. It has also transpired in a question put in last Council held in August 1926 that about a year and half back the Government has purchased " Jinga " for about Rupees one and a half lac. Why was this old vessel purchased? It is still to be reconditioned. " Kalu " was bought for £75,000 and an equal sum was spent on reconditioning it. This " Jinga " was bought 1½ year back it is still lying to be reconditioned. One does not know how much it will come to. It seems there was no purchaser for this vessel for so many years and if so, then when scrap steamship of 5,000 to 6,000 tons are being sold now a days at Rs. 25,000 to 30,000 why was this price paid? It is said that the structure and the material used in building the " Colaba " are of poor quality and although it is not yet made public it may be that this " Jinga " has been purchased to replace " Colaba ". If this is the case it is a serious matter. If the structure work and material are of poor and inferior quality surely makers are responsible for the same. The " Colaba " has cost nearly 35 lacs and such a defect will be a clear defect on which I think makers could be made liable. There is nothing to show when the construction of " George Lloyd " as also of " Colaba " was taken in hand and when they were launched and the Government have not provided these facts up till now while it is commonly believed that they are not brand new machines specially built and launched for these works, because both these vessels have required repairs and specially as " Colaba " is said to have been laid up very often, and heavy repairs have been done to it.

I also wish to place before the Committee that for a long time dredger " Kalu " was said to be lying in the harbour and it is said that Rs. 200 per day were paid to the Port Trust for several months. The dredger " Kalu " was working only a few hours every day for a long period in the Back Bay. It used to work during the high tide and went away during the low tide which clearly shows that the " Kalu " was bought to work in the Back Bay without any soundings having been taken as to whether with its draft she could work there regularly. The " Kalu " was bought in 1919 and it took several months for reconditioning it, and as she was to work in the Back Bay, I think it was sheer carelessness that no care was taken that the vessel should be able to work regularly and the heavy cost of its working may not be wasted.

It has been said that bonus was offered to the dredging staff as an inducement, and that no bonus was earned, but it is being said that while such a statement has been made, it is as a matter of fact that bonus has been actually paid not only to the dredging staff but also to the Chief Engineer and others whose duty was on the land; and further, that the bonus was made payable over the outturn which was put down at 25 per cent. of the guaranteed quantity, while actually the dredger was putting out an outturn which was between 25 to 30 per cent. of the guaranteed outturn. I mention this for the information and inquiry.

It has been said in the Director of Development's report of 1924 that a double line of pipes were being laid for " Kalu " to work side by " Sir George Lloyd ". Nothing has been said as to how much sum was spent on this line of pipes and whether it was ever possible to work the " Kalu " together with the " Sir George Lloyd " from the same place. If the double line was laid which appears to have been done, then it must have cost a very large sum and all this money seems to have been wasted and it further points out that not only " Sir George Lloyd " but even " Kalu " was thought to be able to work there when as a matter of fact it has been found that the Port authorities as well as the Admiralty were never consulted.

Sir M. Visvesvaraya.—Mr. Hooseinbhoy Lalji, you are a member of the Legislative Council and also of the Municipal Corporation?

A.—Yes.

Q.—You have given us a statement expressing your views. We want as many facts and figures as you can give us regarding the origin and conduct of these works. If you could give us particulars of any of the alleged objectionable features of the scheme when it was started, it would be of some help to us. Here you say, " I am sorry to say I feel there is the tendency still after this waste of money to drag in Plot No. 2 with No. 1, with the intention of ultimately forcing the whole scheme ". Tendency on whose part?

A.—Tendency on the part of the Directors. I should like to explain this. This scheme was initiated by the Government of Sir George Lloyd and a Director was appointed. Now, all along the Director has held out hopes that the scheme was a necessity and would be profitable. These facts are well known. When we are asking them to explain how these expenses have gone up and how to meet these deficits, they simply want us to go on further speculating in the manner they have done, that is to say by selling the land and making a profit. But that is not possible. My reasons for saying that it is not possible are quite clear, as could be seen from the land available for sale, particulars of which have been given in the Advisory Committee's Report (pages 12 and 13). Then again, if this scheme was at all necessary, it was not necessary for the welfare of the poor and middle class people in whose interests it seems in the first instance the public were led to agree to it. The public of Bombay have never been in favour of Government speculating on land and making a profit thereby in order to reduce taxation; but they were only led to agree to that, because they did feel that the poor and lower and middle class people wanted some land to live on. That was the general impression. But as far as myself and many others are concerned, we were then of opinion and even now are that this site would be of no avail to these classes of people.

Q.—But if the rich people come over here, there would be more space for other people elsewhere?

A.—The number of rich people who would really take advantage of sea site is very very small and insignificant as compared to the great mass of the people. There will hardly be a fifty thousand people who would like to live on the sea shore, and there is the Malabar Hill, the Cumballa Hill and the Chawpatty. This scheme will not really be within the bounds of the middle class people. I do not know whether I am right, but I have a report of yourself, sir, in which you have stated that the need is for middle classes of people and the suburban areas are the places where they should be induced to go. The only difficulty that comes in the way of the suburban areas being fully developed is the traffic. As regards that, every day we are making improvements. The electrification of the railways now has improved the service very much, and I have all along held that the suburban area is much more suitable to those who really need the accommodation. Ever

in the Legislative Council in the debates I have stated that it was regrettable that the Government had stopped the suburban area schemes, especially those like the Bandra and Khar Road schemes. I am not in favour of Trombay and Chembur schemes. I will speak about this later on. I believe that those schemes have been delayed or have been put off, not so much because the land was not saleable, but because Government must have felt that they were spending a very large sum on the reclamation and they cannot go on borrowing money from the public or from the Government of India. That has been my impression. I stick to it and even now believe that, in view of the fact that the mill industry is towards that side—nearly three lakhs of the population are residing in E, F, and G wards and the clerks, the managers and the engineers would find it very very economic to be near that side rather than this side—if at all there is any need for development, it is in the suburban area. I believe now, after going into the figures of the Improvement Trust Scheme at the King's Avenue, Dadar, and Matunga, there is still a large area to be occupied. It means that even for the requirements of these people we have got a large area almost ready at hand.

Q.—This is the area intended for business interests and for public institutions. It is in the vicinity of what may be called the civic centre of the city, and there was no doubt at the time, *i.e.*, in 1920, there was much pressure on the accommodation then available?

A.—I do realise, sir, that it was said that it was near the business part of the city and as such there may be necessity of accommodation for offices; but to that plea, one has only to see that the whole trade of Bombay is mostly dependent upon the cotton trade, and once it was decided that the Cotton Green should go over to Sewree naturally the great bulk of the business in the Fort has gone and will go there. Rather it is bound to go there. The facilities provided there, the fire-proof godowns, the exchange for the cotton, the docks near by, the mills near by, have really tended to this migration. Even the insurance companies have sent their branches there or are sending them.

Q.—You are now referring to the reasons why this reclamation was not necessary?

A.—Yes.

Q.—The transfer of the Cotton Green was decided recently?

A.—I believe the decision to remove the Cotton Green has been pending from 1913. Actually the land was acquired and the reclamation was begun in the year 1913-14. Therefore it was an established fact that the transfer of the Cotton Green was a question of the land being ready. And this is why I say that if there was any real need for the offices it had really gone down. I must also, say, sir, although I have not referred to it in my statement, that even the grain godowns have gone to Sewree. Large grain godowns have been made, and if an enquiry be made it will be found that in Samuel Street a number of offices have been opened in the residential houses because of the muccadams and brokers who are living there. They are not so much changed as to come and take the sea breeze. They more or less go there about half-past-three or four and return at eight. I know that even my three properties at Samuel Street which are residential buildings and which were fetching Rs. 40 to 50 for a flat are now fetching Rs. 100 to 120, being occupied by offices of brokers and muccadams. I also believe, sir, that even banks will have to be opened there.

Q.—You are leading to the conclusion that it was not necessary to complete this reclamation?

A.—For business purposes it is not necessary at all. Even in our Ballard Pier Scheme I know that so far buildings are incomplete.

Q.—But over-crowding is acknowledged?

A.—I was paying at first a rent of Rs. 350 for my office in the Fort. When during the boom some people came down to Bombay and expected to do business, the rent went up to Rs. 700. Then all at once the rent has gone down, and I am now paying for the same place Rs. 250.

Q.—There was unusual demand for land at the time?

A.—That was more or less speculation. There is no real need for it.

Q.—You are in favour of the minority proposals?

A.—I differ a little bit. I think that block No. 1 and block No. 8 must be completed. My reason is that on block No. 8 we have spent a lot and very little is required to be spent now. Also the Government of India is prepared to buy it up, and so we should not let it go. But when I say this, I wish to make a point, and that is that the Government of India in this bargain have dealt with the Government of Bombay in a manner as if the cost at that time was the cost price for this reclaimed land. That is to say, a price of Rs. 20 was fixed as if it will cost only Rs. 20. Between two Governments, I understand, no Government is allowed to make a profit. But I do feel at the same time, Sir, that the area that the Government of India are getting is seven times the area which they are prepared to sell out, because they have taken this area. I should like to give you those figures, sir.

Q.—They have got vacant land in some other place?

A.—Yes. The vacant land that the Government of India is prepared to sell is about 171,000 square yards, and the land that they will get in block No. 8 is nearly 1,100,000 square yards in area. The approximate value that the Government of India wants paid for this 171,000 square yards was at the rate of Rs. 150 per square yard, which comes to Rs. 2,70,00,000. But the Government of India are getting seven times more land for Rs. 24,000,000. I will give a few more rough figures. Up to July 1926, nearly 5,90,00,000 have been spent and about 15,00,000 will be spent on No. 8 and 15,00,000 on No. 1 plus the interest about 60 lacs. I have taken the date as 31st March 1929 assuming that to be the time when the Military will have the land quite right. I have made that figure to be 6,88,00,000. Because I have made the plea, sir, that the Government of India are contributing on the actual cost, I have worked out those figures. And No. 8 which the Government of India will get will be about 1,100,000 square yards while No. 1 if it is left to us will be 436,000 square yards, the two together totalling 1,500,000. If we work the figure at 45, it comes to about the same value. In that case it will be said that the Government of India at present are required to pay only 2½ crores while under this estimate they will be required to pay 5 crores. But I may say, sir, that I do believe that the Government of India for more than one reason ought to be prepared to meet us.

Q.—They are taking up a large block of land which you cannot otherwise dispose of yourself?

A.—That is a bargain made. And after all we do not know whether they have taken it without requiring it. It may be that they want all these lands. I cannot say that they have taken it for the sake of inducing the reclamation scheme. On the other hand I think that they have taken all this land because they thought they are getting seven times more land than they are going to sell.

Q.—That was the expectation then in 1920, in the boom time. Probably they may also be disappointed?

A.—I admit it. The thing is that the burden of taxation that will fall should be on both the Bombay Government and the Government of India; because, after all, the Government of Bombay are also contributing to the Government of India. Then furthermore it is a fact that the Government of India did not observe those strict rules of sanctioning the whole scheme. If our Government has made a haste, which I contend they have made in this case, then the Government of India have also been rather slack.

Q.—In what way?

A.—I shall give you the figures. They have been very very slack.

Q.—They approved of the scheme for 367 lakhs, and the scheme for 702 lakhs does not seem to have been sent up for approval. It was approved by the Bombay Government.

A.—That is the very fact upon which I want to base my argument.

Q.—Do you mean to say that they should have insisted upon the 702 lakhs scheme being sent up for sanction?

A.—It is an ordinary fact that when the local Government wants funds from the Imperial Government they must put up a case. Even the taking of loans the local Government cannot do of its own accord.

Q.—They do not go into the details of the scheme when they appropriate money. Generally when a scheme is approved, they take it that it is all right?

A.—It is a usual thing when three crores are sanctioned and money up to seven crores are required. They will not give sanction to loans being taken, even for municipal purposes. Even twelve months ago we sent up for sanction certain proposals for taking a loan and they would not sanction it unless they were satisfied that it was really required.

Sir M. Visvesvaraya.—It usually depends upon the recommendation of the Local Government.

Witness.—This was required for the municipality; but when the Local Government was concerned, the Government of India must be careful.

Mr. Billimoria.—You are under a misapprehension with regard to the sanctioning of these variations. Originally when the scheme with regard to greater Bombay was submitted to the Government of India, it was contemplated that the Bombay Government would require 30 crores, and nothing was specially ear-marked as so much for the Back Bay and so much for the other part of the town and island of Bombay. That having been approved by the Government of India, namely the total requirements in respect of the improvement of the city to the tune of 30 crores, the Government of India would be perfectly justified in advancing money as and when a demand was made.

A.—I have seen that the Government of India are not so very easy. When they say that the requirement of Bombay is 30 crores, they always keep a watch, and when high officials come down to Bombay they make it a point to see how money has been spent. Invariably you will find that when the Finance Member or the Viceroy comes down to

Bombay they often see the reclamation scheme. When 30 crores are required by the Improvement Trust, the Port Trust, the municipalities and other public bodies, I humbly submit that the Government of India knew very well what was going on.

Sir Frederick Hopkinson.—Are you suggesting that the Government of India, when they know that the scheme is for 702 lakhs, should say to the Government of Bombay " we cannot approve of this any longer "?

A.—What I mean is this. Unless they are satisfied how this cost has gone up, it is the duty of the Government of India not to advance any money. As far as I know the Government of India had their financial adviser here. I remember very well that when we floated a loan of 2 crores for the Bombay Municipality, Mr. Nixon, the adviser of the reclamation scheme had come to us. He then told us that he was the representative of the Government of India. I believe from the Administration Report of the year 1924-25 also it appears that the Government of India had their own financial adviser to the Government of Bombay. I can only say that the Government of India are never a careless body. It may have been that because of our local Government being so much powerful.

Sir M. Visvesvaraya.—The Reforms had come in by that time. The Local Government thought that they had power to sanction the scheme.

A.—They are quite right; but they are getting the money from the Government of India and the latter should have some control.

Q.—Once the financial portion of the scheme has been settled, the Government of India do not go through the details of it every time.

A.—Again I repeat that for 2 crores for the Bombay Municipality the Government of India sent down their expert.

Q.—That may be because the Local Government did not agree.

A.—That is not so.

Q.—There is also the question of the money market?

A.—I do presume that the Government of India should contribute something towards this. And I say between two Governments, in fairness to both, there should not be any profit and loss concern, and if block Nos. 1 and 8 are decided to be finished, the cost would be about Rs. 45 and the Government of India should bear the cost at this rate.

Sir Frederick Hopkinson.—At the top of page 5 of your statement you say that " the Government of Bombay has given this land to the Government of India on basis of its cost ". Is that correct?

A.—I think so. That is what my enquiries in the Council have led me to.

Q.—It was stated yesterday that the Government of India were paying half the value for reclaiming the 1,145 acres, and they were only getting 265 acres for it?

A.—That is another thing; the open spaces the Government of India will keep for their buildings, and for recreation.

Q.—You say here " that the Government of Bombay has given this land to the Goverment of India on basis of its cost ". I suggest that cannot be correct?

A.—I think it is correct.

Q.—My suggestion is this; that the Government of Bombay then thought that the whole area that they are giving to the Government of India would cost them a certain amount and that they calculated at about Rs. 20 a square yard as the price?

A.—That cannot be right.

Sir M. Visvesvaraya.—The understanding is that Rs. 20 a square yard be paid for the area. The area was fixed and the rate was fixed,and the local Government have to stand by that?

A.—I admit they have to stand by that. If it is the question of a mercantile firm, of course they are legally bound to carry out according to the contract. But it is a question between two governments as to what really is the cost. The impression is that the Government of India would not have gone in for all this had it not been for the big area, and the price for which they were selling the small area. In my statement, I have said " The Government of India have been liberal to the Government of Bombay many times because the Government of Bombay has been contributing nearly one-third of the income tax, *i.e.*, 6 crores ". I remember an instance which I must quote. When we wanted to tax heavily we were told that the Government of India did not like the idea as then the club were incurring the heavy expenditure and it would affect the income-tax a great deal. All this income-tax during the boom amounting to 8 crores and 6 crores includes profiteering on the land. To my mind the Government of India has not done well in encouraging it. They have become like business men. They expected seven times more land besides they expected more income-tax.

Q.—If they are going to get land at cheap rates, they will say: Why don't you completely reclaim and get the money for yourselves?

A.—I say they went for all this because they thought that it was good in their own interests. That was why I appealed to them to contribute more. After all, 2½ crores to the Government of India is hardly one-third of the income-tax. In Bengal they have remitted 66 lakhs for reasons they know best.

Q.—On page 6, you say " the Government of India without getting any estimates from any one allowed the Government of Bombay to contract its purchase ". That is with regard to the dredger " Sir George Lloyd ". Have you anything to say on that? If you will kindly give us further particulars, it will be helpful for our enquiry?

A.—On the 8th April 1919, the question went to the Secretary of State; on the 25th April, a reply was received. On the 26th May 1919, Sir George Buchanan was asked to prepare this scheme, although no sanction from the Secretary of State had come. These are all in the proceedings of the Council. Then the report seems to have come to the Government of Bombay in September 1919. On the 4th December 1919, the Government of Bombay asked the Government of India to allow them to purchase the dredger, because they said " their offer is open for a very short period". I do not know who the other purchasers were and wherefrom. We asked for copies of the contact. We have not received it up till now. We asked whether tenders had been invited, whether estimates had been called for, and I asked for a copy of the agreement. I clearly made a statement about this in the Council and the Honourable General Member could not deny it. " We have a statement here that ' Sir George Lloyd ' was purchased; up to now the Government of Bombay have not got a true copy of the contract ".

Q.—Who said that?

A.—I said that and the Honourable Member accepted the statement. It is on page 1328 of the proceedings of the 16th March 1926.

Q.—Have you anything further to say on that point?

A.—Then we were told that Sir George Buchanan's report was received in September 1919. We find in the proceedings that a letter was written by Sir George Buchanan to Sir George Curtis on the 24th July 1919 recommending the purchase of " Kalu ", and the " Kalu " was purchased on the 12th November 1919. This clearly shows that neither the Government of India nor the Government of Bombay heard anything from Sir George Buchanan. Before that a letter has been sent by him to Sir George Curtis and the purchase of " Kalu " was undertaken from the Government of India. Without anything in their hands, without any estimate even from Sir George Buchanan. But some explanation of what the report contained was sent by the Government of Bombay to the Government of India only on the 4th December.

Mr. Billimoria.—Who said there that the " Kalu " was required for the Back Bay Reclamation?

A.—I will give you the exact wording, if you please. The letter that was sent by the Government of Bombay to the Government of India giving some details of the scheme was dated 4th December 1919. The purchase of dredger " Kalu " was recommended by Sir George Buchanan in his letter of 24th July 1919 to Sir George Curtis in the following terms: ' I think your Government ought to ask the Government of India not to sell the " Kalu " at present, because with new pipe lines it will do very well for reclamation on the east of the Colaba between the Apollo Bunder and the Sassoon Dock which work might go on almost at once '.

Q.—You are making some mistake. It was not for the Back Bay Reclamation.

A.—I belive that it was for the whole scheme of East Colaba Peninsula that Sir George Buchanan was asked to report.

Q.—The Back Bay scheme was entirely different from the other one.

A.—The details were sent in September 1919 to the Government of Bombay, not before that.

Q.—If you will look at the Report, you will find there is a separate report regarding the Back Bay Reclamation.

A.—This scheme was sent to the Government of India.

Sir M. Visvesvaraya.—They seem to have purchased the " Kalu " for the East Colaba Scheme and then transferred it to Back Bay?

A.—As regards that, the General Member said it was bought in November 1919.

Q.—That was purchased for some other work, and transferred afterwards to the Back Bay.

A.—It is a statement which the General Member made in 1926, disclosing all these facts. In fact I want to say that the real sanction of the Government of India was received in October 1920, and those orders for 1.36 lakhs were placed before that.

Mr. Billimoria.—Were not any reasons given to you why an order was placed in advance? The makers would want some time to have the dredgers built. Of course the scheme required the official sanction; but if they had to wait till the scheme was officially sanctioned, then it might take a considerable time before the dredgers were built and got ready for operation. Would that satisfy you if that was the explanation?

A.—Certainly not. Who is to judge whether the dredger was necessary or not without the scheme being sanctioned; without the scheme being approved of who is entitled to say that a dredger at a cost of 1·36 lakhs should be ordered out? Assuming the Government of India had turned down the whole scheme what would be the position?

Sir M. Visvesvaraya.—They obtained the sanction of the Government of India.

Mr. Billimoria.—If it was approved, sanction was a matter of formality.

Witness.—I go back to my point whether the Government of India would sanction such a big scheme without looking into it.

Q.—On the recommendation of the local Government.

A.—It may be; without going into the details, if the Government of India sanctioned it, as you put it, both the Governments are responsible to the taxpayer.

Q.—I am afraid you are mistaken. The Government of India were very, very careful. They did not want to embark on this scheme without a very exhaustive enquiry. In fact, ever since 1907, when various proposals were submitted to the Government of India, they were all turned down and the Government of India set their face positively against the reclamation scheme. It was only in 1919, under the strong recommendation of Sir George Buchanan, supported by the Government of Bombay, that the Government of India gave their approval to it. So, you cannot blame the Government of India.

A.—I quite concede that point. I do know that the Government of India did not give light-heartedly their sanction or approval. But I have maintained from the very beginning that the Government is responsible because after the three crores budget having gone up they ought to have stopped.

Q.—There is a misapprehension in your mind, which if you will allow, I will correct. Under the Reforms it was not part of the business of the Government of India to interfere with the provincial Government's powers. It is left to the reformed council. It was the reformed council that permitted the estimate to go up to 702 lakhs. Even there the Government of India did not come in.

A.—I differ from you.

Sir M. Visvesvaraya.—These things are very uncertain and have not been definitely settled.

A.—Absolutely uncertain.

Q.—Have you anything else to say about the purchase of the dredger?

A.—I am not an expert or an engineer, but I can say this much, usually it is the thing that particulars are forthcoming, but up to now Government have not given any. I am interested in one of the steamship companies. I am a director for the last 14 years. We want particulars as to when the order was passed, when the ship was launched and so forth. Up to now there has been a general impression, because there has been lots of work for the " Colaba ", that these two dredgers were not quite intended for this very purpose. I do not know whether it is a fact or not.

Q.—You have a suspicion that they are not giving you the facts?

A.—The Government would not give us the facts.

Sir Frederick Hopkinson.—You may take it from me that they are meant for this purpose.

A.—Yes. It may have been that the Government of Bombay are unaware of the facts. As they have not got the contract they did not care to find out the information. But there is another thing which I should like the Directorate to be responsible for. I had been about four times with the Director of Development and the General Member on the Back Bay. Once the whole Council went there. We were then given a glowing description of the state of affairs going on. At that time " Colaba " was not working, and they said there was some structural defect. I maintain that if a vessel has got some structural defect or the steel or mechanism is defective then surely enough the makers are responsible. I am not going into the details. That is another question. As to whether the material is hard or soft, I cannot say, I am not an expert, but as the director of a steamship I know very well if there was a structural defect or some material defect in the engine or the boiler defective, if that is the reason. We have paid 30 lakhs for the Colaba and she requires a lot of repairs and has not been working as well as the George Lloyd, the Committee will kindly enquire what is the real defect.

Q.—If you have a steamship built under the supervision of a naval architect to be paid for when your naval architect is satisfied with the contract and when your naval architect gives you a certificate that it is in accordance with the contract, you have to pay?

A.—Quite right.

Q.—It is the same case here. If your naval architect has made a mistake, that is between you and him. It has nothing to do with the builders.

A.—I quite realise that, that is the real principle, that is the legal position. If you appoint a representative and if he has taken charge of the work, then it is all right. But assuming that the steamship builder had contracted for a certain kind of steamship and if it is found that the steamship was not built as contracted for, I think it is not quite legal.

Q.—That is fraud.

A.—Yes

Q.—Do you make a suggestion that there is any fraud in connexion with the construction of these dredgers?

A.—I don't make that; I only wish to draw the attention of the committee as far as the " Colaba " was concerned, not with reference to the " Sir George Lloyd ".

Q.—Then you make no suggestion of fraud?

A.—I don't make.

Sir M. Visvesvaraya.—You say on page 6; " The proceedings of the Legislative Council, if referred to, and especially of the 16th and 17th March 1926 will prove how in the exercise of its functions, the Development Department was virtually unrestrained and absolutely autocratic.". What are the points that you wish to draw our attention to? You say " unrestrained and absolutely autocratic ".

A.—I am sorry I have to use the words. I say it is a fact. First of all, you will see that we were never given any information as to how the position stood from time to time. The first time that we were given any of these particulars was in 1926, although the Government knew that trouble had arisen in December 1924, and of the unsatisfactory working of the dredging plant. In March 1925 they took us from the Council Hall round the works and they told us that it was going on very well. Not only that, but one finds that in fact the General Member and the Director had in February 1925 some strong fight with Sir George Buchanan when he was here as to the satisfactory working. Still in March 1925, in their budget speeches they did not tell us what really happened. We warned them in our speeches to be more careful, that we are spending much more, that the dredgers are not turning out the right outturn, that the costs are going up and so on. But they said " No "—that was the statement made in March 1925—the dredger was making a preliminary canter.

Sir Frederick Hopkinson.—They had a preliminary canter the year before?

A.—Yes.

Q.—It is a long canter?

A.—Yes. We were taken in a special train, and we saw the 3 delivery pipes, one in block 7, and two in block 8, with 42″ delivery pipes. I asked as to how these three were working together from the dredger. My view was that they were going to show that all these things were going to be done.

Q.—You must look at it from another point of view, that ultimately three would be required; a wise man makes provision before-hand. How many pipes were working at the time?

A.—When I went there they had all these three pipes.

Q.—There might be bifurcation from one main; that was quite possible?

A.—I have got my own pumping plants, pumping out nearly 10,000 gallons a minute. It is quite possible that the sluices may be closed on one and put on the other. That is quite possible; but they were telling us—that all the three were working as if we could not understand.

Q.—But you could check that yourself. You knew that the 3 dredgers were at work?

A.—But it may be like this the statement is made in the Director of Development's report that another line of pipes was laid for " Kalu " to work from " George Lloyd ".

Q.—That will be only two?

A.—I do not know. It costs roughly 150,000 to lay pipes from that end to this end. I am not an expect. I asked the General Member and the Director but they have not given the figures. But if it is a fact there was another pipe then the money has been wasted. The advisory committee asked for the information, but they were not furnished.

Q.—Would you mind remembering this? We had all this from several people. We fully understand the point about the advisory committee's powers; therefore if you won't misjudge me it is not much good repeating it again.

A.—I must justify what I have stated. I read the proceedings of yesterday and Mr. Mody has justified this.

Sir M. Visvesvaraya.—That is one of your statements—that the advisory committee's request was not complied with?

A.—Nor information given to the members of the Council on several questions from 1924, 1925 and 1926.

Sir Frederick Hopkinson.—You say, " the Directorate made all sorts of glowing accounts about the working ". Can you give us any indication of such glowing account? I do not think I shall call it a glowing report, but glowing expectations.

Sir M. Visvesvaraya.—Some of the subsequent reports were glowing?

A.—Yes.

Q.—Referring to page 7 of your statement, what are your suggestions as regards the agency methods?

A.—I would suggest that the work should be carried out by the Public Works Department.

Q.—Do you think it should be done by contract or departmentally?

A.—By contract under the supervision of the Public Works Department. I am in favour of contracts.

Q.—What other changes would you suggest?

A.—If it is the Public Works Department I believe it will be a transferred subject, as the department is at present transferred. Then I desire an Advisory Committee.

Q.—But an Executive Committee has been recommended by some witnesses.

A.—My difficulty is with regard to the constitution. Unless an Act is passed and the whole department taken away from Government there cannot be an Executive Committee under our Constitution. That is my reading of the Constitution of the Government of India Act. There could be an Advisory Committee with powers to advise the Ministers and ask for all particulars.

Q. You want an Act like the Improvement Trust or the Port Trust?

A.—I don't think it is necessary for this work now. I should be content with an Advisory Committee working with the Public Works Department and the business can be done by contractors by inviting tenders, the estimates being made by the Public Works Department. I want in this Committee that everything should be placed before them. Under the constitution we had of the last Advisory Committee only such matters as the Director was pleased to put before them were considered.

Q.—You want certain executive powers of approving estimates, contracts, etc.?

A.—Yes, that is all.

Q.—On page 8, you say, " he did that probably at the advice of Sir George Buchanan and the whole affair was done in hot haste for which there was no justification ". You refer to the purchase of dredgers?

A.—Yes, I think I have said so.

Q.—You say, " it is a fact and an important fact too that the labour wages from 1920 to 1926 are the same in Bombay, *i.e.*, Rs. 1 to Rs. 1/1 to a man cooly and As. 10 to a female cooly and as all work that was given out mostly depended on labour wages which are the same as at present prevailing ". You think that the labour wages have kept up?

A.—Yes, Sir. If you want I can give you some figures.

Q.—Were the rates reduced by the Corporation and other bodies?

A.—Yes, not only they, even the Development Directorate themselves. If you will kindly see the rates that were given for the unloading of rubble stone, moorum, the loading of the moorum at Kandivli, the unloading of the dry-filling at Churchgate, at Colaba, the rates given by the Director of Development in 1924-26 vary to the extent of 25, 30, 50 per cent.

Sir Frederick Hopkinson.—Where are these rates given?

A.—The thing is like this. We have not been supplied by the Government with information.

Q.—I understand you to say that these were the rates given by the Director of Development.

A.—Yes Sir, given to the contractors by him. These are the rates which I have got from the public by making enquiries myself.

Q.—You are sure they are right?

A.—These rates were mentioned in the Legislative Council debates.

Sir M. Visvesvaraya.—You want to say that this should be enquired into by the Committee.

A.—Yes.

Sir Frederick Hopkinson.—Have you asked the Director of Development what rates he is paying so that you can compare?

A.—I did ask him and I asked the General Member. But they did not give the rates.

Q.—You could not get them?

A.—I could not.

Q.—Will you tell me some of these rates?

A.—Yes, I will.

Sir M. Visvesvaraya.—What were the local rates then and what rates are paid at the present moment?

A.—As far as labour was concerned the rates have been throughout Rs. 1 to a male cooly and annas 10 to a female cooly. I will give you concrete instance. I am told that at Colaba the unloading of the moorum was first done at Rs. 4-8-0 to 4-12-0 per wagon in the first instance.

Q.—What was the correct charge to pay?

A.—Rs. 1-12-0. Then in 1925 the rates were reduced to Rs. 3-12-0 per wagon and the present rates are working out at Rs. 2-8-0 per wagon.

Sir Frederick Hopkinson.—Is this very high?

A.—According to the labour charges, it comes to Rs. 1-12-0 as I have worked out.

Sir M. Visvesvaraya.—What is the rate usually paid now for cooly labour?

A.—Re. 1. If you want the detailed working of it I can give you. Usually 2 men and 2 women are employed to unload 2 wagons and their cost comes to Rs. 3-4-0 for 2 wagons, and if you add 7 per cent. supervision charges the rate would come to Rs. 1-12-0, or 1 anna 7 pies per ton or for a wagon Rs. 1-12-0.

Sir Frederick Hopkinson.—Is that the price that they ought to pay?

A.—This is the cost at present, at which all the contractors are carrying out their contracts.

Q.—What is the cost at present?

A.—Rs. 1-12-0.

Q.—That is what the Development Department is paying?

A.—No, it is paying Rs. 2-8-0.

Q.—They ought to pay Rs. 1-12-0?

A.—This is actually the cost of the contractor who is carrying out at present. As the Development rate means 42 per cent., the contractor will be willing to do their work for 20 per cent. Former contractors used to get 100 or 50 per cent. more. The same thing applies with regard to the Churchgate filling, which comes from the city. They are paying higher rates. The former rate was Rs. 3-8-0, 3-4-0 and Rs. 3. The present rate is Rs. 2-3-6. I have said in my statement that sub-contracts were given. I am quite prepared to prove these facts also, because at the present moment even the dry-filling brought to the Churchgate street from the city is being purchased by these contracts at Rs. 1-4-0 to 1-8-0 per brass. They are getting rates at Rs. 2-2-0 from the Development Department.

Q.—Do they purchase it and transfer to the department?

A.—They arrange with the motor lorry people who buy the debris in the city. The rate every day varies from Rs. 1-4-0 to 1-8-0 and the contractor pays for it in hard cash and they get a contract with the Development Department for Rs. 2-3-0.

Q.—What is the material at present given to the contractor?

A.—He brings motor lorries .....

Q.—Does he pay for it; the person who takes the motor lorry does he pay for the rubbish?

A.—At the present moment these motor transport companies purchase debris from the city .....

Q.—Do the motor lorry people pay for it?

A.—They get something from the people who are breaking down their property to carry it away. They get Re. 1 per brass.

Q.—How far is this brought?

A.—Sometimes it has been taken a mile, sometimes 2 and sometimes 2½ miles.

Q.—What does it cost them?

A.—They say it costs them about Re. 1 per brass.

Q.—I do not believe it. It can't be done.

A.—There is another thing also. They get from the Back Bay Contractor Rs. 1-4-0.

Q.—You say that the cost of transport is Re. 1 per brass to convey it to the site of the reclamation. Who unloads it?

A.—The motor lorry drivers.

Q.—Who pays him?

A.—His master.

Q.—Is that all included in the Re. 1 per brass?

A.—No.

Q.—What is the amount?

A.—Unloading and loading cost 8 annas for loading and 8 annas for unloading.

Q.—That is about two annas or a little over a cubic yard?

A.—I don't know. I have not done this business.

Q.—It is a little over two annas per ton for loading and unloading and carry it to a certain distance. Isn't that an extraordinary price?

A.—It may be, but the question is this, that every day 100 lorries are being sold at the Churchgate at Rs. 1-8-0 and the contractor purchases it, pays it hard cash. He supplies to the Development Department at Rs. 2-3-0. The Department is paying one more rupee. The Department has got its own motor lorries for which they pay Rs. 2-8-0 to bring this debris.

Sir M. Visvesvaraya.—Own means hired by them?

A.—No, they have got their own motor lorries. They go to a contractor and pay him Rs. 2-8-0 and he brings the debris from the city. Now the thing is he gets Rs. 2-8-0 from the Development Directorate, Re. 1 he gets from the party who sells this.

Q.—Do you suggest it is a bad bargain?

A.—I do not say it is a bad bargain. If the Development Department were to put themselves in communication with the Municipality and the Improvement Trust who break down buildings for reclamation they would really have placed a contractor who would bring this debris from those places. They might get it cheaper. Of course, that is a limited quantity. That can be used for filling block 1.

Q.—In any case it is a trifling matter.

A.—Well, 100 brass every day, almost the dry moorum you want.

Q.—We want 60,000 cubic yards in all, and your quantity is little.

A.—The former rates that were given for the unloading of the moorum were terrible: Rs. 4-8-0, 3-12-0, while at present it is Rs. 2-8-0.

Sir Frederick Hopkinson.—(Addressing the Secretary of the Committee) Would you ask the Development Directorate to show what they actually paid for this.

(Addressing witness) After all what you are telling us is not your own knowledge.

A.—No. The rate before 1924 was Rs. 4-8-0 and then in 1925 Rs. 3-12-0. I should also like that you should kindly ask the rates for unloading of rubble and the loading of moorum at Kandivli.

Sir F. Hopkinson.—(Addressing Secretary) You may ask for a list of the prices for loading at Kandivli and unloading at Reclamation.

Q.—In page 9 you say, " I am told that no estimates were prepared as are done by the Public Works Department or the Municipality, nor were any enquiries ever made of the Municipality, Improvement Trust or the Port Trust as to the rates prevailing at which they were employing labour and the rates at which they were carrying their contract ". We are told that estimates exceeding Rs. 65,000 are sent up to Government and those within that amount are prepared by the Chief Engineer and the Development Directorate?

A.—I have put many questions as to the estimate of throwing dry filling in No. 8 block. No figures were given. They have not given us any figure. So I conclude there was no estimate. The Improvement Trust, the Port Trust and the Municipality get big contracts.

Sir M. Visvesvaraya.—(Addressing the Secretary of the Committee) We might ask them to send up sanctioned estimates for perusal. It will be well to have some of the estimates to see the procedure adopted.

Sir Frederick Hopkinson.—Are you suggesing they did not understand their own business?

A.—The Heads of Department do not care much and their subordinates do it carelessly and I would even say they have not interested themselves; they have been grossly negligent, lax, to a very great extent. Really speaking even all our well-known contractors whom the Municipality had employed or the Port Trust or the Improvement Trust had employed would have carried out this dry filling.

Q.—The reason might be that the prices may have been too high?

A.—Their prices are very low. They have received contracts for crores of rupees.

Q.—Some of the prices you mentioned to me I have a very great difficulty in believing.

A.—This is in 1926. If you compare them with those of 1924, you will find the difference. The unloading of wagons in 1924 cost Rs. 4-8-0 and now it is Rs. 2-8-0. These figures are not very big and the quantity is also small. But the real difficulty is with regard to the unloading of stones, of moorum which was carried on from 1921-25. These rates have to be taken into consideration along with those at present prevailing, while the labour has been the same. One instance will make it quite clear. A contractor came down almost penniless who was convicted. He received contracts from the Development Department and was said to be worth about 5 lakhs. We were told in the last Council that that contract was stopped.

Q.—In regard to your statement on page 11, " it is commonly believed that they are not brand new machines specially built and launched for these works ", have you any specific facts to prove this?

A.—I have explained in the beginning that no information was supplied.

Q.—Again, " it is a matter of fact that bonus has been actually paid not only to the dredging staff but also to the Chief Engineer, and others whose duty was on the land, and further that the bonus was made payable over the outturn which was put down at 25 per cent. of the guaranteed quantity, while actually the dredger was putting out an outturn which was between 25 to 30 per cent. of the guaranteed outturn ". Have you any reasons for thinking that bonus was being paid irregularly like this?

A.—The statement that was made to us in the Council that no bonus was earned. The suggestion made by Sir George Buchanan was that the quantity that was probably fixed

was not approached, but as a matter of fact I have got information, which I cannot say is a fact, that a bonus was paid.

Q.—We know it was paid and I should say it was properly paid in order to get better results.

A.—I do not see any objection if they can turn out good work.

Sir M. Visvesvaraya.—Do you know who made the indents? You are referring to it on page 8.

A.—I do not know.

Q.—Do you have a copy of them?

A.—No, we could not get information.

Q.—Why do you think it was carelessly done?

A.—Because many times they invited tenders for the purchase of surplus stores. They must have indented for such a large quantity that the surplus stores were saleable.

Sir Frederick Hopkinson.—That is a very common thing in Government Departments. You and I would not do it.

A.—The thing is we should be very careful to indent. Once it was said in the Council that surplus stores to the value of Rs. 6,00,000 were sold.

Q.—Who stated that?

A.—I remember that the Director once admitted in the Council that certain steel bars valued at Rs. 2,50,000 were indented of a wrong size.

Q.—That might have been the mistake of the draftsman. Mistakes will happen.

A.—But to the extent of indent being made of steel bars valued at Rs. 2,50,000? That is a big sum. There is no purchaser and I think they are still lying.

Q.—There is probably an explanation.

A.—There may be. In 1925 they bought some pipe lines probably for these dredgers and they did not report to the Council or anybody and a year after they came for sanction from the Council. I don't know how payment was made and why a sanction was obtained a year afterwards.

Q.—They may have been very necessary for the works.

A.—I admit it. They indented for pipes and paid for them. They forgot to obtain sanction and a year afterwards they ask for it from the Council for making the financial statement. This was not a small item: Rs. 1,50,000 worth of pipes.

Sir M. Visvesvaraya.—It sometimes happens?

A.—That's how things were managed.

Q.—Rs. 1,50,000 worth of pipes?

A.—Yes, Sir.

Sir Frederick Hopkinson.—What you really mean is that the formality of getting the estimates is not complied with?

A.—Yes.

Sir M. Visvesvaray.—Did you not ask for explanation?

A.—We did ask the explanations. Take the example of the Port Trust, the Public Works Department and the Bombay Municipal Corporation, they have been doing business of crores of rupees. I am also a Member of the Standing Committee, where we had very large stores and once Mr. Billimoria's firm were asked to check the stores.

Mr. Billimoria.—It's possible that the item might have been overlooked, Mr. Husseinbhoy.

A.—Sir, I have already pointed out several items.

Q.—Do you say that the stores were needless and that they were unnecessary?

A.—This lacs of surplus stores which were sold of it means unnecessary. A lot of cement is being sold while I do not know why this cement was at all indented, perhaps it might be that they first thought to indent out for this cement and afterwards this cement was not required.

Sir Frederick Hopkinson.—If it was due to any alteration made by the Government in the progress, then you cannot blame them? Can you?

A.—No, I cannot blame the Executive.

Q.—If the Government wished to alter it, you cannot wish to blame the Executive?

A.—Of course I cannot blame the Executive, but I am doubtful who is responsible between the Executive and the Government, but you will find lot of cement being sold though were ordered out at a very heavy cost.

Q.—(Turning some page). The total receipt up to 25th March 1925 were 79,000. How that would cover all the sales? It's very difficult to find out whether the Director of Development says this item relates to Back Bay or building of chawls or one of the other schemes.

A.—That's why we were in difficulty. At one time one of the well-known contractors of Bombay (that gentleman's name I am not permitted to say out), submitted his tender?

Q.—Did they not consider that tender?

A.—I maintain it very strongly that none of our well-known contractors were being given this work though they are taking contracts of crores of rupees. It is not my only contention that because they were unsuccessful in getting the contracts, they are considering the Directorate to have accepted higher rates, but that there was gross carelessness.

Q.—The prices might be higher? Do you know what the prices were at that time?

A.—Yes, I know, and I am not in a position to say whether tenders were not accepted although tenders of several contractors were very low.

Q.—Had these low tenders been then accepted?

A.—I have already told you that you will easily find it out from the tenders receipt file, the tenders accepted file and the tenders rejected file.

Q.—There might be a specific reason for it?

A.—If you will, Sir, kindly tell me the names of the contractors who have carried on the work I will tell you that they were not men worth giving contract for Rs. 100 and that's the class of men who have carried out the work in preference to several other well known and reputed contractors who were not given any contracts.

Q.—What do you suggest?

A.—I suggest that there is something very wrong about the management.

Q.—There might be very adequate and sound reasons?

A.—I am prepared to submit that their prices were lower than those of the contractors and tenders accepted as I have made personal inquiries in the matter.

Q.—Can you give the name or any date of such contract by which we can more easily get at it?

A.—The trouble is this that that gentleman has not authorised me to give out his name and I again as a gentleman cannot give you his name.

Mr. Billimoria.—This is a public inquiry, why should names be kept back? If people who have information cannot put forward it before the Committee and simply make allegations and accusations against the Government, why should they not come boldly and give out the information?

A.—You will find out that name from the files. He is not a man of Bombay and he is again not a big contractor. I am not ordered to give that man's name and I cannot do so as I have already told you. I do not blame anybody because the Committee is there to attribute the blame to whosoever deserving.

Q.—But how is the Committee to find out without materials before them?

A.—I have given you materials namely you have to take out the letters of the contractors wherein you will find some 30 to 40 tenders which were simply invited, while only one man got the contracts all the time, in preference to several other well-known big contractors though their rates were low.

Sir Frederick Hopkinson.—That is a very serious charge to bring against the department? Is it not?

A.—I would really point out to the Committee to find all these out.

Q.—Would you not consider this a very serious charge against it?

A.—It is so and I do maintain that with regard to the Back Bay contracts several contracts of higher rates were accepted in preference to contracts of big firms quoting lower rates.

Q.—We have no facts in this connection?

A.—You have got facts. If you were to make inquiries in regard to rates and other factors, you would.

Q.—Perhaps rates would have gone high?

A.—You will find from the tenders.

Mr. Billimoria.—Do you expect this Committee to go through a mass of papers, tons and tons of papers and files? There might be some questions on which we require definite and clear information and if nobody were to come forward boldly to give all that out, how are we to make out?

A.—Sir, I have given you everything, the rates, etc., and I see no justification in accepting the extraordinary rates.

Sir Frederick Hopkinson.—Well, if you don't give us any specific instances and names, I conclude that you have based your estimates on hearsay gossip.

A.—I think Sir, I have not made myself quite clear, but I do feel that I have given you sufficient data to make inquiries about.

Q.—No, you related everything on gossip. That might be, as it's nothing but gossip. You refer to cement sold without much care from the surplus, you mean cement was sold to any of the contractors?

(*Mr. Billimoria.*—His name is not given.)

A.—His name is Mr. Balkishendas Damodardas.

Q.—Why did'nt you mention it?

A.—It's business morality.

Q.—Well I don't call it that, I am very sorry there are no facts. There is not a single fact. These are only statements that somebody has told you?

A.—What somebody has told me is true, because I am not a contractor. There was the case of a contractor who was given contracts at a rate 150 per cent. more than the prevailing rate and the lucky fellow got contracts to the tune of about 9 lakhs.

Mr. Billimoria.—150 per cent. more?

A.—Yes.

Q.—You are thereby insinuating that somebody distinctly gave this contract to him or was sharing profits with this man?

A.—It amounts to that unless he was a fool.

Q.—Is this the insinuation? I want to get at it here?

A.—I should certainly insinuate, unless the man who was in charge of that work was a big fool.

Sir Frederick Hopkinson.—On page 11, you say that the structure and the material in Colaba are weak? Who says that?

A.—I have made it clear. We were told during the debates that the Colaba structures were weak even during the council debates, not only that but that the Colaba structures required a lot of repairs.

Q.—On page 11, structural material must be weak. What evidence have you got with regard to that?

A.—Because Government have admitted that the structure is weak.

(*Sir Frederick Hopkinson.*—That does not say that the structure is weak; it might be badly designed.)

Q.—Suppose you order out some machines, do you always get good machines, perfect?

A.—Not perfect always, but if it's a defect of a small character we do not mind.

Q.—What you seem to mind is that you were not told anything in the Legislative Council?

A.—I do feel that.

Q.—And then you go on making this statement that it is commonly believed that these two dredgers are not new and so on? I don't accept your statement and I want to judge why should I take any notice of other statements?

A.—Sir, you may or may not take it, we don't mind.

Mr. Billimoria.—Mr. Husseinbhoy, how long have you been a Member of the Legislative Council?

A.—Three years.

Q.—You were not a Member of the council at the time the scheme was launched?

A.—No.

Q.—May I inform you that at the time the scheme was launched no member of the council criticised the scheme but that on the contrary they commended the scheme and congratulated the Government on the courage shown in undertaking the scheme?

A.—Yes.

Q.—Now because the scheme had turned out to be a failure and unworkable that criticism is being made?

A.—I want to tell you once again what others have said that the estimates have gone high and before that time nobody complained about it.

Q.—Of course nobody complained at that time, Mr. Husseinbhoy, in your evidence you have stated that the Government of India, accepted 270 lakhs for the Marine Lines area for the military and that they are paying only 240 lakhs for an area in Colaba 7 times as big. Do you know Mr. Husseinbhoy, that land on Queens Road near the Church Gate Station is much more valuable than land at Colaba?

A.—Yes, prices ruling in Colaba are about 20 a yard whereas those in Church Gate are expected to realise 100 per yard.

Q.—Is it not fair then for the military to acquire more area and pay the same price?

A.—I quite agree with you.

Q.—If you refer to page 7 of your note you state " that ' Kalu ' was bought for £75,000 and an equal sum was spent on reconditioning it ". Have you got any facts and figures to show that? I am afraid it is not an accurate statement.

A.—I quite realise that.

Q.—We expect responsible gentlemen in your position, when they come to give evidence, to make statements which are supported by facts?

A.—But the question is, I would make it clear, I have come down not as a prosecutor. I have come here to help the Committee and I have tried my level best to do it. I am not here as an accused person or a prosecutor.

Q.—We do not want any impression left that there are accusations against the Government which are not true.

A.—I have cleared the position. I think I have put down " about the equal sum ".

Q.—On page 4 of your statement you make recommendations. You say that block 2 should not be taken in hand because it would be very difficult to dispose of land in that area. You adhere to that view?

A.—Certainly.

Q.—You go on and say that there is no need for accommodation for Government offices?

A.—Yes, I say that.

Q.—Perhaps you are unaware that there is a great congestion in the building where we are sitting. Government requires some more accommodation for Government purposes?

A.—Government may require it but they must cut their coat according to their cloth. I do not think we want it. This is my own personal view.

Mr. Billimoria.—The other questions have already been asked and I shall not cover the same ground again.

(The witness withdrew.)

31st Witness

Mr. D. D. Rodrigues

Examination of Mr. D. D. Rodrigues, Member of the Advisory Committee, representing the Kurla Municipality

Sir M. Visvesvaraya.—You are a member of the Advisory Committee?

A.—Yes.

Q.—You represent the Kurla Municipality?

A.—Yes.

Q.—Are you a signatory of the minority report?

A.—Yes.

Q.—Have you anything to say regarding the conduct of the scheme in the way in which the scheme has been administered?

A.—For the present I can say that the Development Department should be abolished.

Q.—Do you still adhere to the recommendations in the minority report?

A.—Yes, I do. On some of them I have changed my mind.

Q.—The working of the dredgers has improved since and if any improvement is shown, you will be willing to modify your views?

A.—I do not think there will be any improvement.

Q.—You recommend the abolition of the Development Directorate; do you still adhere to that view?

A.—Yes.

Q.—Why?

A.—Because they are unable to manage it.

Q.—What would you replace it by?

A.—Partly, for the Back Bay Reclamation portion, by the P. W. D., and for the building portion, I would recommend the Improvement Trust, and partly for land, the Bombay Collector of the Suburban Districts.

Q.—We are only concerned with the reclamation?

A.—Then I recommend the P. W. D. I would say that block 8 should be completed and this work should be transferred to the P. W. D.

Q.—Block 8 will have to be completed for military purposes. That will be completed in any case.

A.—It should be done.

Q.—Then an immediate declaration should be made regarding the abandonment of the rest of the scheme?

A.—I consider that blocks 1 and 2 should be taken when the reports of the other committees are out. Till that time it should wait.

Q.—If the committee's report is favourable, then you are in favour of blocks 1 and 2? What do you say about block No. 7?

A.—Other blocks should be abandoned for the future.

Q.—No. 7 is shallower than 2 and is much cheaper to reclaim?

A.—That is my own opinion.

Q.—Have you heard that block 2 will be costly?

A.—I cannot tell you.

Q.—You say " the re-examination of all the schemes that arose from and were affected directly or indirectly by the Back Bay Reclamation "... which are those schemes you refer to?

A.—Like the building of the Salsette scheme.

Q.—You mean the railway terminus from Marine Lines and Colaba should be abandoned?

A.—Yes.

Q.—You live in Kurla, can you tell us if earth and moorum for filling can be obtained from that side?

A.—Yes.

Q.—In large quantity?

A.—Yes.

Q.—How far is Kurla?

A.—11 miles. At present the Improvement Trust get their moorum from there but they have abandoned their scheme.

Q.—Is it a very large quantity?

A.—Yes, there are about 3 or 4 hills.

Q.—Have they been tested?

A.—For the present Improvement Trust are bringing their moorum for filling from one or two hills.

Q.—You are in favour of completing blocks 1 and 8?

A.—No. I am in favour of completing block 8. When the committee's opinion is out, then Nos. 1 and 2 should be considered.

Q.—You have no opinion about block 7?

A.—I am of opinion that work on other blocks should be stopped.

Q.—Do you approve of any scheme for a marine drive along the sea wall?

A.—Whatever is suggested in the minority report, I do not want to go beyond that.

Q.—The minority report represents your views?

A.—Yes.

Q.—Have you any reason to change it?

A.—No, except what I stated.

Q.—Have you any other facts or figures to give which should be investigated by us?

A.—I could have given sufficient facts and figures about Bombay suburban development but that does not concern you.

Q.—As regards the Back Bay Reclamation is concerned you have nothing more to suggest?

A.—I would say that the Back Bay Reclamation scheme should have been entrusted to private bodies like the Municipality. If they were unable to carry on their duties of course they would have been suspended or held unreliable parties. Of course in future the work should be done in accordance with the minority report.

Q.—If the P. W. D. is entrusted with the work, do you want an advisory committee?

A.—I would say independent advisory committee consisting of half officials and half non-officials.

Q.—Like the Improvement Trust?

A.—Yes.

Q.—Would not the Improvement Trust be able to carry on the work?

A.—Yes it would be better. It represents Bombay fully.

Q.—Who will be ultimately responsible?

A.—We have stated that in the report fully. Partly those who gave wrong estimates. It went up from 4 to 7 and then to 11 crores.

Mr. Billimoria.—Those persons who were responsible for framing the estimates?

A.—Yes, who were responsible for not looking into it properly.

(The witness withdrew.)

32nd Witness

Mr. A. N. Surve, M.L.C.

Written Statement of Mr. A. N. Surve, M.L.C.

History and Conduct

1. The launching of the Development Scheme of which Back Bay Reclamation forms but a part if judged from the following points, *viz.* :—

(*a*) *Opening Balance.*—Budget Estimates 1920-21 Rs. 4,94,58,000. (Revised Financial Statement Government of Bombay 1920-21, page 2.)

(*b*) *Permission* given to Local Governments to raise loans,

(*c*) *Condition of Trade* as reflected in the Revenue of Stamps—*Budget Estimates* —1920-21 Rs. 82,50,000 (*Ibid*) and Actual Rs. 1,58,66,287—the highest figure ever reached (Administration of Bombay—1920-21. Page 147.)

or

(*d*) In the *Income Tax* collected Rs. 3,17,53,370 (Nett collection as given in Administration of Bombay 1920-21 amounted to Rs. 3,80,89,116—*vide* page 147) on an income of 63 crores and over—out of which Rs. 1,40,03,792 and Rs. 22,45,67,690 represent respectively the income tax collected and the profits of Companies and registered firms (Income Tax Statistical returns of the Bombay Presidency 1920-21, page 2.)

(*e*) *Chronic Demand* for more land in Fort area as evidenced in various Government Schemes of 1911, 1912 and 1917, and proposals for reclamation by private enterprise.

(*f*) Appearance on the scene of Sir George Buchanan with his Song of Enchantment of reclaming with dredged filling at a cost of 5 annas per cubic yard and at a total cost well within 4 crores.

(*g*) The *condition of the City* as described in the following words "For all that makes home life pleasant—light, air, space and cleanliness, it (Bombay) is indeed a city of Dearth—for the children it is a city of Death" (His Excellency's Speech in Council on 3rd August 1920).

(*h*) The serious shortage in the Housing Accommodation available for the Working Classes (*Ibid*) then considered *real* but now represented as erroneous.

(*i*) The belief of Sir (now Baron) George Lloyd in the importance of housing on the general contentment of the people as manifested in the following extracts :—

> "Good houses mean the possibility of Home-life, happiness and health; bad houses spell squalor, drink, disease, immorality and crime and in the end demand hospitals, prisons and asylums in which we seek to hide away the human derelicts of society's own neglect";

and

on the opinion of 7 out of 8 committees of the Royal Commission appointed to inquire into the causes of Industrial Unrest—

> "that insufficient and bad housing was one of the factors responsible for unrest."

(Working Class Budgets—Bombay—1923, page 25.)

(*j*) The desire to make Bombay one of the most orderly cities in the world and worthy of the name of "Greater Bombay."

would make it appear that it was *justified*. It was so considered by the Government and the Legislative Council of that time who were experiencing the conditions—mentioned above—then prevalent. To-day Back Bay Reclamation has proved a *failure*, in the light of later events and an attempt is being made in the present state of depression with depressed outlook of examining schemes which were undertaken when everybody—however humble or elevated—was riding on the crest of a wave of prosperity, when everyone was living in the exhilerated atmosphere which engendered *speculation* and when things were thought of and done in the foolhardiness begotten out of easy circumstances. Therefore the Back Bay Reclamation which was not the entire Development scheme but which formed only a part of it appeared *sane, reasonable* and *remunerative* to the mind of 1920 though it appears to the mind of 1926, insane, *irrational* and *disastrous*, and it will prove more so because it has formed the subject-matter of the inquiry *singly* and as detached from the entire scheme of which it formed a part only. I therefore consider the Terms of Reference of the present Committee very narrow. I also consider it desirable that the whole of the Development Scheme should be examined as regards its

necessity, conception, execution and its effect upon the well-being of the Bombay Presidency. (My views on the subject are given below in paragraph number 10).

2. The facts, that the Reclamation has been engaging the attention of Government for so many years—for over half a century since 1865; that they had been carrying it on small scale as experimental measures since 1910 (near Marine Lines Station) the chronic pinch for more space felt more severely on account of the pressure of increased population drawn to the city by the war operations and subsequent prosperity, the extensive operations carried out in execution of a co-ordinated Development Scheme by Public Bodies, *e.g.*, the Municipality (Mahim woods, Tansa Water Works, the Eastern Avenue) the Improvement Trust (Worli Schemes) the Port Trust (Mazagaon Sewri Reclamation) and when the Government who had financed and encouraged these bodies to undertake these works had done nothing themselves,—it appears—all these facts drove them into instant action, which was accelerated by the conditions mentioned in paragraph 1. Circumstances other than these would have dictated greater caution, more and better regard for the financial interests of the Presidency.

It may also be that the mind of Government had exerted itself so long and so much that at the pscychological moment when the decision was taken it was hardly capable of performing its function in a manner which the immensity of the scheme required.

3. The financial difficulties experienced by the Government in balancing their Budgets coupled with the power to raise loans on their own account led them to adopt the *Unnatural Doctrine* that the present generation owed no duty to the future generation of handing down to them a free and unencumbered heritage, if the latter cared to have it, posterity must be prepared to accept it with the burden which the prudence (or rather the lack of it) of the present generation has seen fit to impose. That is how the Government attempted to defend its Loan Policy. Its adoption made Government less circumspect and more unmindful of the seriousness of commitments which they were entering into.

4. The Inauguration of the Reformed Council's ushered a new state of things. The relations and Control over provincial matters which subsisted between the Governments of India and Bombay had undergone a change.

5. The Reformed Council—with its limited power over Reserved Subjects—raised its feeble voice now and again but without success in regard to the *impracticability* of the Scheme on account of its vastness, and against the imprudent Loan Policy adopted by Government.

6. The policy of *reticence* adopted by Government, which was broken only when compelled to give information which too was supplied insufficiently and evasively kept the Council in darkness as to the real state of affairs.

7. The highly coloured pictures of expected profits and advantages which the responsible government officers—whose high positions commanded implicit faith in their official statements—presented to the Council, threw it off its guard, and made it swallow stuff which was intrinsically unswallowable.

8. The constitution of the Legislative Council, its procedure defined as it is by its Rules and Standing Orders, the practice of allowing insufficient time for it business, weakness induced into the Council on account of existence of parties and divided counsels, did not allow its members to arrest the headlong career towards disaster which the Government had inherited from its predecessor, until the whole Presidency was faced with the impending catastrophe.

9. These briefly are my views on the first part of the Terms of Reference, *viz.*:—
History of the Inception and Conduct of the Back Bay Scheme.

10. My *views* on the subject may be gathered from the following extracts from my Budget Speeches of the years 1922 and 1924.

> "The work undertaken by the Development Directorate is very large, and requires technical knowledge to judge it; therefore, I shall not venture to offer any remarks on it but I mention that some people are doubtful about its success. When I consider that 65 lakhs are to be spent next year for the purpose of acquisition of land alone, my heart trembles to think of the misery that would be entailed on those people who would be turned out of their hearths and homes and whose status would be reduced from that of cultivators to that of labourers. It is perhaps too late to express remorse, but I can not help expressing it. I think we were promised more information; but so far I have received one report from that department. I think it would be well if Government took the public into their confidence, because that would silence interested criticisms, and remove doubts and misunderstandings from thinking minds."
>
> (Council Debates Volume V, Part I, Page 133.)
>
> *21st February 1922.*

And again

" Coming to its being painted in very bright colours, I refer to the Development Department which is represented to be a very substancial source of future revenue. The very attractive and catching phraseology that is used in mentioning that matter reminds me of a very tempting cake behind a glass cover to which one is prevented access. Whether it will melt and disappear, we do not know."

(Council Debates Volume XI, Part III, Page 116.)

20th February 1924.

11. Turning to the *second part* of the Terms of Reference, *viz.* :— the *recommendations as regards future* operations, I beg to submit that the situation as it is presented to-day is *serious* and the present depression has only added to intensify its seriousness, but it should not unnerve us unless it is desired to court irretrievable loss. It is imperatively necessary to keep cool and to keep our wits about us. Our present duty is to proceed on the hypothesis that for many years to come Back Bay Reclamation Project of 1920 is a failure financially, that the expectations of gaining a profit of 50 crores has proved fabulous and is unrealisable; that the provincial exchequer has lost a vast amount of money—amounting to crores which at the present moment cannot be definitely predicated; that the Province is burdened with a debt on this account of over 5 crores and it is increasing every day both in principal and in interest until we decide upon our course of action.

12. Our next duty is to so shape our course as to retrieve our position as far as possible, to reduce our real loss and to turn our present seeming loss into gain—if we can.

13. In performing this two-fold duty we need not be *interestedly alarmistic* or unduly *pessimistic*. Depression generates pessimism—but it is a passing phase, and past history will come—if appealed to—to our rescue. Bombay possesses the reputation—almost as ancient as the hills—for its Government possessing a weakness to play the role of " *wonder makers* " and for spending public money in its gratification on seemingly foolish reclamations which later experience showed were not really so. In this connection the following extracts from " Maclean's Guide to Bombay," 1895 Edition, may prove not only interesting but perhaps heartening also.

" *Modi Bay Reclamation.*—Modi Bay Reclamation, extending from Carnac Bridge to the Mint, was begun by the Government on its own account about 25 years ago, to obtain a good site for the Commissariat Stores and Offices, but was never used for that purpose. It has since been often strongly recommended as the best site for docks, and it might have been turned to good account in this way if the Government had not for reasons unknown, chosen to buy the less eligible adjoining site for 2 million sterling. It is pierced through the centre by the Frere Road—80 feet wide—which divides it into two nearly equal portions; the one next the harbour is vested in the Port Trustees; that towards the west still belongs to the Imperial Government. The area reclaimed amounts to 84 acres and cost about 30 lakhs. No other roads have been made, but the drainage has been partially completed. There is no place along the whole foreshore more convenient for traffic than Modi Bay; but although large sums of money have been spent upon it, no serious attempt has been made to provide a proper landing place for passengers and goods. Page 271.

And

" *Hog Island.*—A gigantic hydraulic lift formerly existed there, and was an object of great interest, but now it is never used, and its remains must be regarded as constituting a monumental piece of folly. When in the year 1872 Government opened the hydraulic lift on Hog Island the immense machine was looked upon as the most gigantic affair of the kind that had ever been erected, and even now there are not to be found in the whole world many lifts as powerful, even although it lost much of its power by the neglect and ill usage it sustained when abandoned by Government as a failure. The story of the construction of the lift. its opening, its trial, and abandonment, though somewhat serious for Government, is interesting and almost amusing. It cost £350,000; and was originally meant as a dry dock for vessels belonging to Government—particularly troopships. But Government was very chary about it first, and it was not until after a heavy and careful test, they would take it over from the contractors. The lift, then being pronounced a success, was considered worthy to take its place amongst the wonders of the world, and bring the number up to ten. Therefore, one day towards the end of the year, the then Governor of Bombay, and a large number of guests were invited over to Hog Island to view this tenth wonder of the world. The party set sail from Bombay in a large vessel, with which the great power of the lift was to be illustrated to His Excellency. But the experiment, unfortunately, did not prove a success. It was the intention to run the ship right under the lift and raise it out of the water with the Governor and party on board. But instead of being lifted out of the sea, they were very nearly

all sent to the bottom, whether it was that some miscalculation was made in the direction of the current, or that the speed of the vessel was not slackened on approaching the shore, we cannot say; but certain it is, the steamer, instead of floating neatly between the columns ran down two of the outer pillars with such force as to knock holes into them, and damage her own bows. There were no congratulations that day upon the tenth wonder, nor were the Governor and his party raised in their vessel on the huge pontoon. Shortly after this, the lift began to be looked upon with suspicion, not on its own account, for its power was not doubted but on account of the difficulty in approaching it. The water was deep enough, surely; but the currents were so troublesome that large ships could not be guided in without much trouble and even danger. Ultimately Government decided to abandon it; and they did. The pontoon was floated on shore, and left to go to pieces for aught any one cared. Time wore on, until about some years ago, the P. & O. Steam Navigation Co., finding they had not sufficient dry dock accommodation at Mazagaon for not only their own vessels, but ships belonging to other companies they were asked to repair, turned their eyes to the neglected hydraulic lift at Hog Island. Negotiations were entered into with Government and an agreement was come to. The P. & O. Co. secured a lease of the lift, Government reserving to themselves the right, which they seldom take advantage of, of using the lift for any of their own ships when necessary.

* * * * * * * *

When P. & O. Co. took over the lift, Capt. Newall was deputed to go across and superintend the opening arrangement. His first study was those currents. He spent two days watching, and having done so, the docking of the ships was commenced. This work was conducted for some years under the superintendence of Captain Newall, and so successful was he all along that there never has been the slightest accident." Pages 349—351.

14. The only recommendation I am prepared to make at this stage is the one which I did on the 17th of March to the Council (*vide* Council Debates Vol. XVII, part XX, pages 1378 to 1380). It may be summarised as :—

(*a*) Concentrate all operations on Block No. 8 alone. Expedite its completion with all the means at present available, *i.e.*, without making any further capital outlay. Hand it over to the Military Authorities as early as practicable, and with its proceeds liquidate in part the loan debt, so that further liabilities on interest charges are reduced.

(*b*) Inquire into and ascertain the effect of the reclaimed land upon the Development Schemes of the Public Bodies, *e.g.*, Municipality, Improvement Trust, etc.

(*c*) Examine the reliability of the figures of cost given in the estimate submitted by the Chief Engineer, and if they are found unreliable obtain firm and reliable estimates.

(*d*) If the reclaimed lands will not have any adverse effect upon the Development Schemes of the Public Bodies which are financed by Government out of loans raised on the credit of the Presidency, and if the estimates indicate that blocks 1 to 7 could be reclaimed for the purpose of reducing the loss, then do so but with the sanction of the Legislative Council obtained after supplying its members with *full* and *true* information.

(*e*) If the inquiry indicates the desirability of proceeding with the work—I prefer its being carried out by contractors instead of with official agency—Development or Public Works Department.

(*f*) Adopt precautions to safeguard the health of the Public which the cessation—complete or partial—or postponement of the work may require.

(*g*) If Development is to be carried out it should become a transferred subject.

(*h*) Obtain revision of the Meston Settlement as early as can be obtained.

(*i*) Appeal to the Government of India to bear a part of the loss.

15. To conclude—the present state of our knowledge about the Back Bay Reclamation does not warrant us to make any specific recommendations. Only a formula can be suggested and it is " *make your bearings certain, proceed with caution, try to reduce the present loss* ".

Sir M. Visvesvaraya.—You are a member of the Legislative Council?

A.—Yes Sir.

Q.—Your full name is Mr. Surve?

A.—Yes Sir.

Q.—You were a member of the Advisory Committee also?

A.—Yes, I became associated with it at the beginning of 1925. I was not in it from the beginning.

Q.—Presumably you have not signed either Report?
A.—No, I have not.

Q.—Are you in favour of either of the reports or neither of them?
A.—I am in favour of neither. That is why I did not sign.

Q.—You have given your own recommendation now?
A.—Yes, and also to the Legislative Council on the 17th March.

Q.—Do you wish to specify in what respects your views differ from those of the two committees?

A.—Oh yes. The majority want that the work should be continued for two years more and thereafter they want to come to a final decision. My objection to that was that as we had exceeded our estimates it was not safe to go on the estimates prepared by the Chief Engineer. Therefore we should confine our attention and energies to block No. 8, complete it as quickly as we can, hand it over to the Military authorities and liquidate the debt.

Q.—On that point both Committees are agreed.
A.—To a certain extent they were.

Q.—And then?

A.—About why I was not in favour, we had actually about 86 lakhs, I think, of square yards of land available in Fort area, and if we were to go on with our reclamation work, whether 22 lakhs or 360,000, still we would be adding to the land that is already there, and we do not know what will be its effect upon the land values. Another point was that the Bombay Municipality is engaged upon its Hornby-Ballard Scheme and it has undertaken it, and at present as far as my knowledge goes it is considered a losing scheme. So if we throw more land on the market from the reclamation area the Municipality is also likely to suffer, and the Municipality has been financed by the Bombay Government out of loans. The Municipality at present also has to pay a very great part of its income on interest alone. Therefore if with the Bombay Government the local bodies like the Municipality and the Improvement Trust came to grief it would be very disastrous. And if the Municipality came to grief the whole public of Bombay is likely to suffer in the matter of its local needs, and the greater part of the suffering would fall on the middle and lower classes. Take for instance conservancy matters or other amenities. If the Municipality's revenues are not satisfactory, these services will be affected, and its consequences will have to be borne by the public in general, but especially by the middle and lower classes whose number is very great.

Q.—In what other respects do you differ from the recommendations of the other Sub-Committees?

A.—Well, I thought that the suspension of work pending the results to be arrived at by the Committee simply meant waste of time and by that time the interest charges were increasing. Therefore the only thing that could have been suggested was to go on with all their energies on block No. 8 and in the meanwhile to ascertain the reliability of all these figures and then to go on cautiously.

Q.—That is your view now?
A.—It was so from the time the report was under preparation.

Q.—With regard to the origin of the scheme you have said here and very rightly at the bottom of page 2 of your note, " Depression with depressed outlook of examining schemes which were undertaken when everybody—however humble or elevated—was riding on the crest of a wave of prosperity, when every one was living in the exhilarated atmosphere which engendered speculation and when things were thought of and done in the foolhardiness begotten out of easy circumstances." The times then were quite different from what they are to-day?
A.—Yes, Sir.

Q.—Then you go on to say, " Therefore the Back Bay Reclamation Scheme which was not the entire Development scheme but which formed only a part of it appeared sane, reasonable and remunerative to the mind of 1920 though it appears to the mind of 1926 insane, irrational and disastrous." Well, we are looking at it in an atmosphere of depression?
A.—Yes.

Q.—Some allowance will have to be made for the change of atmosphere?
A.—Yes.

Q.—What was the object of starting the scheme in such a hurry?

A.—I think I have stated it. The Government had the Development idea practically from the year 1910, and the other bodies, the Municipality for instance and the Improvement Trust were carrying on their work, whereas Government alone had not done anything, and naturally they were very anxious, because otherwise the other public bodies would have done their part and Government itself would not have done anything.

Q.—They feared they would incur reproach?

A.—I should think so.

Q.—For being unenterprising?

A.—Not so. The idea was a concerted one. The other bodies and Government were to expand Bombay and develop it. The other bodies had done their duty. Government had done nothing.

Q.—Then again at page 4 you say, " The policy of *reticence* adopted by Government, which was broken only when compelled to give information which too was supplied insufficiently and evasively—kept the Council in darkness as to the real state of affairs ". Can you explain that? Can you give any facts?

A.—Well, I can only say this, that we were asking questions so often, but the only thing Government would go on telling us would be in a very, I should say, reserved manner. Take for instance, we asked the question only in the last session as to the output of the dredger from the Back Bay into a particular block. Government at that time only gave us the output from the Back Bay side and at that time I had to inquire of them whether it was not possible for them to give the same on the other side of the reclamation. The Honourable the General Member said it was possible but he did not give it. I can explain it to you why it was given on the other side and not on the reclamation side. It shows the larger output. It was very recent.

Q.—The larger volume was in the reclamation. That is, the quantity in the reclamation was larger. It bulked larger than the quantity actually dredged. So the facts are contrary to what you say now?

A.—What I have been saying is that when dredged from the water you would dredge more, but actually the amount found on the reclamation area would be less. So Government gave us the larger figure, not the smaller.

Q.—It was actually so last year? The quantity was larger? That is the reason they told you so?

A.—I do not know. The question was asked in the last session only a fortnight back. You asked me as to how the Government was answering the question evasively. This is an illustration.

Q.—Was it not clearly explained to you?

A.—No.

Q.—They were formal replies?

A.—Yes. Of course I asked supplementary questions, because I knew there was difference in the output on the two sides. That is why I put in a supplementary question.

Q.—Did you understand the answer?

A.—He only gave me the answer that he could give the quantity on both sides, but the figure on the other side was not ready. I knew it was less than the quantity shown.

Q.—The quantity that was dredged was thrown into the reclamation area. Actually the quantity bulged. So it is not true that there was less quantity in the reclamation area.

A.—No, my point is this. Government should have given us the figures on both sides. They did it on only one side. They gave me the figure which was dredged.

Sir F. Hopkinson.—Therefore the Government understated the results. They did not exaggerate:

A.—May be.

Q.—Again in paragraph 7 you say, " The highly coloured pictures of expected profits and advantages which the responsible Government officers whose high position commanded implict faith in their official statements presented to the Council ". Are there any instances?

A.—Any number. I can give you the instances. I am quoting from the budget speech of the Honourable the Finance Member for the year 1923. It is a small paragraph, and I shall read it. I have not got the Council Debates here. I have got his speech printed separately. The date is the 19th February 1923. I am reading a part of the paragraph. " The total expenditure on the reclamation of the Back Bay and East Colaba is estimated at 8½ crores and will be completed in 1930-31. Large returns may be expected from 1927 onwards. In that year 2½ crores are expected from the exchange of military lands. By 1930-31 the returns will amount to 4 crores. And by 1935 the whole expenditure will have been recouped. We shall have still in hand for future disposal as net profit an area of some 6 lakhs of square yards, the value of which may be estimated at several crores ". Now I shall explain this.

Q.—Who has made that speech?

A.—It is Sir Henry Lawrence. We were told that the reclamation will be completed in 1930-31, that we might be expecting a return from the year 1927 and the other areas will be brought into market from 1930-31 and in about 1935 we shall have 6 lakhs of square yards on hand which will bring in crores of rupees as net profit.

Q.—Untold wealth?

A.—Yes. I can multiply instances. Some of them are worth taking down.

Q.—They are given in Mr. Manu Subedar's Report?

A.—If you are satisfied with those I shall not say any further. Mr. Manu Subedar has not given these I am going to state. Then there is the speech of Mr. Cadell in 1924. There he definitely states that the profit will be 50 crores. It is a very small paragraph of two lines. The paragraph reads as follows. It is really a speech of Mr. Lawrence, but as he was ill at the time, it was read out by Mr. Cadell, and in it he states, the second part of paragraph 23. " This figure 55 crores gives us a standard with which to measure the value of the additional area that is to be reclaimed from the sea ". I shall give you the substance of what he led us to believe. What he said was this, that if a line were to be drawn from east to west near the Crawford Market you will find that the total area is about 1,450 acres, just as much as will be reclaimed if the 1920 project were fully carried out. He estimated the value of the land which is actually in existence in the Fort area at 55 crores of rupees. And he said they were reclaiming from sea land equal in area and in value, *i.e.*, 55 crores of rupees at an expenditure of about 5 crores. Deduct 5 from 55 and you will get 50 crores. That is the impression I got from it.

Q.—On page 5 of your note you say, " On account of existence of parties and divided counsels " you could not exercise any influence on Government?

A.—Yes, that is so. And you may add to it that during these times the Swarajya Party were staging their walk-outs. They were observing vows of silence. Practically the whole Council was in a demoralised state.

Mr. Billimoria.—Is that the fault of the Government? Whose fault is that?

A.—I do not venture to give any reply to that. It is the business of the electors.

Q.—You have complained of there being splits in the party. You are complaining in this paragraph about party splits?

A.—No, it is not that. At present there are certain well-defined parties in the Bombay Legislative Council, and on account of that whatever is in the interest of a particular party is looked down upon by the others.

Q.—But this is a question in which all are interested?

A.—Well, they are certainly. But you see if you will observe vows of silence you cannot act together.

Q.—On page 6 you come to recommendations for the future. Now are you satisfied with the agency and the methods of administration now? If not, what changes would you recommend. You have given a list at the end.

A.—I want the work done by contract.

Q.—Do you want the present Development Directorate or would you like to have the Public Works Department take up the work?

A.—No, if you want to get the work done by contract agency supervising agency will always be required, but the Development Directorate need not be in existence.

Q.—You want some department of Government to control? Well, you can hand it over to the Public Works Department for instance?

A.—There will be no objection, but there is one point, and that point is this, that Government must not treat it as a reserved subject.

Q.—That is the second recommendation of yours?

A.—Yes.

Q.—You want to treat it as a transferred subject?

A.—Yes.

Q.—Then do you want any control by the public bodies in Bombay? It has been suggested that a Committee should be appointed, that it should be an executive committee. Do you want a Committee at all, and if so, what should be its character?

A.—Well, that would depend on what line of action you take, Sir. If you just make up your mind as to how you are to proceed, an Advisory Committee will no more be necessary, because the Advisory Committee is necessary to lay down only certain principles or policies. We assume that the Enquiry Committees that are working at present will come to some definite conclusions from which we can for some time to come draw up definite schemes, and if we adopt those schemes and give out contracts, and nothing remains.

Q.—They say that a Committee is required to give out contracts and to sanction minor estimates?

A.—Well, it is merely a matter of execution but I will not venture to give any advice.

Q.—Then about the order in which the blocks have to be carried out. First and foremost you would concentrate on No. 8 and complete it?

A.—Yes, Sir.

Q.—And then you next take up No. 1?

A.—That would depend upon the conditions precedent which I have imposed. If it is found that we could reduce our loss by creating land in block No. 1 or 2 or 7, whichever it is, then only we should undertake that work.

Q.—Do you think that further investigation is necessary?

A.—Certainly. At least so far as our present state of knowledge goes, I think it is a counsel of prudence to have further inquiries made.

Q.—You refer to some precautions to be observed to safeguard the health of the public. What are they?

A.—Well, at present there is one Sanitary Committee, and their work has been satisfactory as far as I know. The health of the public has not suffered, and I attribute that satisfactory result to their operations. Therefore, until the Back Bay Scheme ceases to be a source of danger to the health, that Committee should remain in existence and they should carry on their operations.

Sir M. Visvesvaraya.—You say that the Government of India should be appealed to bear a part of the cost. On what grounds?

A.—The grounds are these. The Government of Bombay have since the year 1910 been submitting schemes of their own for reclamation and the Government of India have been turning them down every time. At the last moment they have sanctioned those very schemes. If they had given their sanction earlier, I do not think this disaster would have occurred. Therefore I hold the Government of India responsible for the very sorry state that has arisen now.

Q.—Do you say they were assured that the estimates were satisfactory?

A.—That is an official matter which goes on without our knowledge. What is passing on between the Local Government and the Government of India we do not know. But as outside public interested in the welfare of the presidency, we see that, if the Bombay Government were not authorised, to say that the Government of India sanctioned their scheme.....

Sir M. Visvesvaraya.—The Government of India have not sanctioned the scheme.

Witness.—I do not know, but that is what we are told.

Mr. Billimoria.—Where?

Witness.—I think it was in the Council of Sir George Lloyd in 1920.

Mr. Billimoria.—Can you refer me to the page of the proceedings?

Witness.—I should look up.

Q.—You say that the Government of India turned down the scheme three times. Don't you give them any credit for that?

A.—No. At that time those schemes were very small schemes. The cost that was given appeared to be more reasonable than what it is to-day, I mean that of 1920. Therefore, if the Government of India had at that time sanctioned any of those schemes, perhaps there may have been vast profits, because the great war intervened and at that time there was a great demand for land in Bombay and all the land which would have been created could have been sold like hot cakes.

Q.—It is because the land does not sell like hot cakes and because the dredger has failed that everybody is at the throat of Government?

Witness.—Which Government?

Sir M. Visvesvaraya.—The Bombay Government.

A.—It is not so. It is because the Bombay Government did not treat us quite as fairly as they should have done. And therefore if the result turns out unsuccessful, the Bombay Government cannot claim our sympathy.

Q.—They did not take you into their confidence?

A.—No.

Q.—Are there any other facts or figures which you want us to go into as an enquiry committee?

A.—I have practically summarised everything in my last paragraph. I have nothing more to add.

Sir Frederick Hopkinson.—What proportion of the rates are paid by the lower and middle classes?

A.—I cannot give you the exact figures. But my idea is that all the properties in Bombay are occupied more or less by the lower and middle classes. The richer classes live in a few particular localities only. So if you exclude these areas which are occupied by the richer classes and the mill and other factory areas which pay general rates, then all that which remains is paid by the middle and working classes.

Q.—Is it the case that up to now the principal effect of the reclamation work has been to take away from the city of Bombay four miles of the present seashore?

A.—It is. Only a part is now available to us. I think I am the greatest sufferer by this curtailment because I am deprived of my walk in the evening along the seashore.

Sir M. Visvesvaraya.—You are anxious that it should not continue to be an eyesore for a very long time?

A.—I am not much after ornamentation. If we could do it at a small cost, by all means it should be done; but if the cost is going to be prohibitive, I should hold my hands and allow it to remain. I am perfectly sure that after the time of depression goes away, this thing will not remain in the state in which it is at present. I have quoted our past experience where that reclamation remained for nearly a quarter of a century, then

all at once the Alexandra Dock Scheme came into existence and that area has been occupied. This is only a passing phase.

Mr. Billimoria.—You read some passage, paragraph 22, from the speech made by the Honourable the Finance Member in 1923, in which Sir Henry Lawrence made a statement that he expected to realise about $2\frac{1}{2}$ crores from the reclaimed area to be allotted to the Military Department in or about 1927?

A.—Yes.

Q.—It was not quite out of the mark; it was a practical proposition that he made?

A.—If the dredgers had worked satisfactorily, he was quite right in stating that.

Q.—In spite of the dredgers having failed, it is not an impraticable proposition?

A.—In the present instance the question is not the failure in the output of the dredger alone but there have been several other things; it extends to the men working on the dredgers and also the area where the dredging operations had to be conducted. All these have combined.

Q.—You cannot blame Sir Henry Lawrence for a speech made in 1923. When he made that statement it looked all right, *viz.*, that by 1927 an area would be ready and Government would realise about $2\frac{1}{2}$ crores.

A.—I can give you a qualified answer; because since the Enquiry Committee has been conducting its work, fresh things have come to our knowledge. Therefore in the year 1923 Sir Henry Lawrence, if he knew the facts, was not justified in making such a statement, as he should have known that the dredger was not properly manned. He must have known also that the area over which dredging had to be done was curtailed.

Q.—If you have misconception of the facts, would you correct yourself? In 1923 nobody knew what was going to happen.

A.—If so, I stand corrected.

Q.—What is the general opinion of the members of the Council, whether the scheme should be pushed on or whether you should go cautiously?

A.—I have not sounded them on that point and that question never arose. The moment we received the second *ad interim* report the whole Council was greatly surprised, and if the Swaraj party had been there perhaps we could have taken some effective steps.

Q.—What steps?

A.—At least we could have cut down the total grant.

Q.—What would have been the result?

A.—The Government would have taken protective measures quickly. That would have been the only practical result. Even if the Council were to cut the whole grant, still it being a reserved subject Government could have restored it. But at least the Council could have recorded its opinion.

Q.—You would have made some noise?

A.—Not necessarily noise, but some practical effect too.

Q.—In your statement on page 8 you say " concentrate all your energies in filling in block 8 ". Does that suggest that the energies in the other directions have to be abandoned altogether?

A.—As far as the reclamation is concerned—yes.

Q.—You want only block 8 to be constructed and you want to leave the rest?

A.—For a time only. I am asking you to ascertain the reliability of estimates. If they are correct, then the second step should be taken, *viz.*, to ascertain if this fresh land would affect the development schemes of the public bodies. If they will not be affected and if our estimates are correct, then by all means proceed with the work.

Q.—Do you know that in block 1 some work has already commenced? Would you leave it in that stage or would you like it to be completed?

A.—If it would not compete with the lands actually in existence and which are owned by the public bodies then by all means create that new land. But if it is likely to compete, then hold your hands.

Q.—Would you like to complete block No. 1 now?

A.—I would like to leave it at the present stage.

Q.—And let it be washed out?

A.—There is the wall.

Q.—And leave it in that unhealthy state?

A.—There is the Sanitary Committee working.

Q.—You want the Sanitary Committee to devote their attention the whole time to that block?

A.—The Sanitary Committee is actually doing that now.

Q.—That is your idea?

A.—Yes.

(The witness then withdrew.)

The Committee met at 11 a.m. on Saturday, the 21st August 1926, with Sir M. Visvesvaraya in the Chair

33rd Witness

Mr. K.F. Nariman, M.L.C.

Mr. Nariman's Written Statement

(*Note.*—Certain passages from this statement have been omitted on the ground that they relate to matters outside the Committee's terms of reference. The omissions have been marked by asterisks.)

In response to the invitation from the Back Bay Inquiry Committee, I submit the following written statement.

I propose to treat the subject under three sub-heads : Constitutional, Financial and General including Administration and Management.

As regards the Constitutional aspect of the question, even before I entered the Council and began to study the subject, I strongly felt that the creation of a special Development Department and giving it certain powers and functions under a special Act, was a serious encroachment upon the ordinary constitutional rights and privileges of the local Council under the Government of India Act, 1919.

If it were not for the special Department under a special Act, most of these activities would have ordinarily fallen under Public Works or Industrial Matters, both of which sub-heads are under the Devolution Rules transferred subjects, and as such would have been directly under the financial control and supervision of the Council and without its specific sanction no expenditure could have been incurred. When introducing the Bill and creating the special Government Department, the then Governor Sir George Lloyd had openly declared that the object was to remove the trammels and control of the House so that the work may not be hampered but proceeded with expeditiously. Even the persistent request of the Municipal Corporation to allow one of their representatives on the Directorate, associated with its Executive, was consistently refused though the Corporation was made to contribute by raising a special tax called " Cotton Cess ".

Thus whatever the intention of the principal organiser, Sir George Lloyd, from the record it is clear that from the very inception, the desire was to keep every public body and institution out of its secret chamber and not allow either the legitimate or constitutional control of the Council or any interference by the Corporation, and the subsequent policy of hush-hush and secrecy adopted by that Department is quite consistent with their original desire.

As soon as I entered the Council, my first effort was to restore the control of the Council on the finance and I accordingly gave notices of resolutions requesting the Government to abolish the Directorate and transfer its activities to P. W. D. which being the transferred subject all the items of expenditure would have to be submitted to the vote of the House ; but that resolution was unfortunately never ballotted and hence there was no opportunity to move it.

The question is whether a local Government can by a special legislation overrule the provisions of the Government of India Act which is an Imperial Act, and remove from the control of the Council certain Government activities which under Devolution Rules, are legally assigned as transferred subjects. The reason for this unconstitutional departure was that the Reformed Council being considered raw and inexperienced, it was not considered fit to be entrusted with such a huge and novel project. Hence the experiment was tried with the Executive and the results have proved disastrous. Therefore my submission is that the first recommendation should be to deprive the Executive of these special and extraordinary powers and transfer the rest of its activities to P. W. D. and thus restore the supervision and control of the Council.

When I failed in getting the Directorate abolished, my next effort was to get a Resolution passed in the Council in October 1924 as under :—

" This Council recommends to Government—

(*a*) That a Committee consisting of 12 non-official and elected members be appointed to inquire into the whole administration and working of the Development Directorate, to suggest ways and means of effecting retrenchments and to report on the advisability or otherwise of continuing the schemes taken in hand ;

(*b*) That the Development Directorate be requested to co-operate with the said Committee and afford all facilities and help in conducting the said inquiry and in making the said report ;

(*c*) That an independent officer or expert be appointed to help the said Committee."

Government ignored this resolution of the Council, and instead of appointing an Inquiry Committee as recommended by the Council, invited some members only to join the Advisory Committee. I was one of the members thus invited but I refused to join till the Advisory

Committee was also given the power to investigate in accordance with the terms of my resolution. That condition was not accepted and the correspondence on this subject between me and Government is before the Committee.

Thus not only would the Government not allow even responsible members of the Council to inquire into the administration and working of the Department that had cost crores of rupees to the public, but every effort on the part of every one to get correct information on important details was also defeated by irresponsible and false statements by responsible members of the Government in the Council. Numerous instances of such misleading statements to the public have been already exposed by the Committee, but I will add a few more glaring instances which will satisfy the Committee that a deliberate and persistent method had been adopted not only to keep the public entirely in dark but worse still, to mislead, by inaccurate and false statements.

Referring to the purchase of Dredger " Kalu ", Sir Lawless Hepper said to the Council on 24th October 1924, " I submit, Sir, that in purchasing this dredger at the price they did, the Government of Bombay did not make *at all a bad bargain* ". When questioned as to what was the original and the revised estimates of the scheme, the reply given to both was seven crores. When again specifically questioned " Was not four crores the original estimate " ? The Honourable Mr. Cowasji Jehangir : " That was not the original estimate. It was seven crores. The estimate the Honourable Member has in mind is the estimate which Sir George Buchanan first placed before Government " (*vide* Council proceedings, 15th October 1924, see answers on page 266).

Now it has transpired that the original estimate on which Government of India's sanction was obtained, was four crores (*vide* Government of Bombay's letter to Government of India dated 4th December 1919), and that was subsequently raised to seven crores without any sanction of the Council or Government of India. That was admitted by the Honourable General Member himself ; still in October 1924 in reply to a specific supplementary question, he definitely stated that four crores was never the estimate of Government but was only submitted by Sir George Buchanan.

Another instance of contradictory statement is furnished by the record of the Council as regards the date of appointment of Sir George Buchanan. Two different dates are given by the General Member. On 13th March 1924 he said " that the agreement was actually signed in March 1921 but was agreed to by Governor in Council on *31st March 1920* subject to the sanction of the Secretary of State ". According to this statement this appointment commenced from 31st March 1920. Whereas according to the statement made by the same General Member in the Council on 17th March 1926 a telegram was sent by local Government to Secretary of State on 26th May 1919 " The Government decided to employ Sir George Buchanan who is at present engaged upon work ". Apparently the first statement that his appointment was agreed to on 31st March 1920 is not correct as immediately after his appointment Sir George Buchanan was asked to report on 30th May 1919.

But the most glaring false statement is contained in the Interim Report of the Advisory Committee published so late as 17th February 1925. Sir Lawless Hepper was the Chairman of that Committee and is the first signatory to that report. The following is an extract from the said report :—

" It would appear, therefore, that the Back Bay Reclamation Scheme, having reached the stage it now has, should be proceeded with unless it can be established that there are serious grounds for believing that the scheme is unsound from an engineering point of view, or that it is likely to result in an ultimate financial loss greater than that which would be entailed by closing it down. As regards the first point, *the work has proceeded smoothly according to programme, and its stability has been tested by several monsoons. Whatever apprehensions, therefore, the public may have had on this score the Committee see no reason to suppose that the Project cannot be successfully completed.*

" In regard to the possibility of financial loss, the *expenditure has, up to date, approximated closely with the forecast,* the total including interest charged, to 31st March 1924, being Rs. 412·39 lakhs, against the forecast figure of Rs. 421·16 lakhs."

This statement is made and signed by the Head of the Department in February 1925 in an important report for the information of the public and Council and on the strength of that statement, several members even recommended completion of the scheme.

It now transpires that this was a deliberately false statement intended to mislead the public and Council with the object of hushing up the bungle.

According to our information, in a departmental letter to the Government written about the same time, *viz.*, 27th January 1925, a few days before he signed and published this report, Sir Lawless Hepper has painted quite a different picture and apprehended a serious loss, and even in his evidence before the Committee he has admitted that long before this, *i.e.*, in May 1924, he had first realised that the misdescription of clay in Sir George Buchanan's report was one of the mistakes which had proved disastrous ; still in February 1925, as a responsible Chairman of an important Committee, he misleads the whole Committee, the Council and the public by an absolutely inaccurate statement that the work was progressing smoothly, that public apprehensions are false and there was no doubt about the success of the project. I submit that

he owes an explanation to the Committee and the public for these apparently inconsistent statements. Besides these, the Committee has already referred to misleading statements in the annual Reports. I have only given a few glaring instances, simply to show that these misstatements are not the result of mere innocent mistakes or "error of judgment", but only represent part of a policy of secrecy maintained by the Government throughout.

In its inception, as shown above, the legitimate constitutional control of the Council was removed by what I consider to be a manœuvring in legislation. Then again, not even informally consulting any public institution of importance in the city such as Port Trust, Royal Indian Marine, Indian and European Merchants' Chambers, etc., resisting the request of the Municipal Corporation to allow one of its representatives, ignoring the resolution of the Council for a public inquiry; and added to all that deliberate, false and misleading statements to the public even after the bubble had burst; all these series of circumstances naturally make one suspicious about the *bona-fide* intentions of Government in launching this huge scheme in this extraordinary manner and proceeding with it in a most unusual and unbusinesslike way.

Perhaps it is already brought to the notice of the Committee that in the year 1910-11 the Tatas, a private firm of great repute and standing, considered this question of reclamation and one of their representatives, Mr. Ratan Tata, consulted the best available experts, Messrs. Jacobs and Davies of New York. Mr. Hewett, a representative of that firm, came to Bombay and had surveyed the situation from various standpoints and considered different methods of reclamation. Mr. Hewett made a first report in May 1910 and Mr. Charles M. Jacobs, President of the firm, submitted another report on 21st March 1911, wherein he states: "In my opinion this huge scheme is unnecessary and chimerical to the last degree. We think that Government has got hold of the Reclamation idea and has run it to death without fully balancing in all their aspects what benefits and what harm will accrue to the city by this gigantic piece of meddling with the natural situation. We have spoken our minds quite unreservedly on this matter, and perhaps more forcibly than we would have done in an official and formal report, believing that what you desired was not such a report, but merely a personal and thoroughly frank expression of opinion."

I herewith attach a copy of these reports hoping that they may be of some use to the Committee.

These reports are embodied in the Bombay Development Committee's report, 1914, at pages 199 and 185. That report is in the possession of the Government. It is not known whether Government, before launching this scheme, took into consideration these important reports recently made on the very subject by a firm of Engineers who were reputed to be one of the best on questions of reclamation. If these reports that were so easily available to Government were not considered before finally launching this scheme, it discloses a further piece of negligence on the part of Government.

But more important than these reports is the opinion which was expressed about the Dredger working in the Port Trust Reclamation and which was subsequently purchased by the Directorate for the Back Bay Reclamation. Mr. Billimoria of Messrs. Tatas, while giving evidence before the Development Committee on 12th December 1913, stated that in the opinion of these experts (Jacobs and Davies) the life of the Dredgers was not very long and the Port Trust Dredger was also coming to the end of its usefulness. Mr. Hewett was of opinion that the Port Trust Dredger would not last long for the purpose of the Reclamation (*vide* pages 320 and 321, Bombay Development Committee's Report, 1914).

Though the Government had in their possession valuable opinion of reputed experts that the Port Trust Dredger would not be of any use for further reclamation, still some years after they buy it at an enormous price even after it was further worn out by some work at Basra. Government did not consult the Port Trust that had actually experienced its working nor did they refer to the record in their own possession which gave a definite opinion that it would be useless.

This also incidentally shows the amount of care and caution exercised by a private firm before launching a scheme as contrasted with the negligence and ignorance displayed by Government.

Responsibility

It is rather amusing to find, when the whole muddle is exposed, the two principal parties concerned each attempting to throw the responsibility on the head of another. Sir Lawless Hepper attempts to shift the whole burden on Sir George Buchanan and Sir George Buchanan in his turn throws the whole blame on Government. When in the Council, members criticised the expert or questioned his competency the Director always stood up to defend him and even described these attacks on a gentleman who was not present to defend himself, as cowardly.

My submission is that Government and the head of the Department cannot and ought not to be allowed thus to exonerate themselves entirely from blame by shifting the whole responsibility on the expert. First and foremost, Government or the individual who was responsible for

appointing Sir George Buchanan on the post is primarily to be blamed. The circumstances under which this most important and lucrative appointment was made, are most extraordinary and certainly call for a thorough and searching inquiry. The question is whether Sir George Buchanan's appointment was made on merits or personal considerations. This may appear to be rather an unpleasant job, but the Committee will have to probe into it in order to fix the ultimate responsibility.

The following are some of the extraordinary and unusual circumstances in connection with the appointment of Sir George Buchanan :—

(*a*) Although the post was of very great responsibility and on the selection of the man practically depended the success or failure of the scheme, still the post was not advertised in British or European or American papers but the choice immediately fell on Sir George Buchanan. This is contrary to the usual practice particularly for an appointment of an extraordinary expert. The terms offered were so tempting and the remuneration so lucrative that a public advertisement would have attracted most capable, competent and experienced candidates from all parts of the world. Even when such an unimportant post like the principal of the Elphinstone High School was to be filled in, Government advertised it in papers in England inviting applications, and it seems inconceivable that for such an important appointment the choice should at once have fallen on one man and none else given an opportunity to have their claims considered.

(*b*) It is admitted that Sir George Buchanan had no previous experience of such huge reclamation in open sea nor had he any special training for the same. His previous record shows that he was only a Port Engineer and Chairman of the Second Class port of Rangoon and on his retirement, is alleged to have done similar work in Mesopotamia. How was he then qualified to be the sole adviser and consultant for such a gigantic scheme ?

(*c*) His appointment was made in such hot haste that the Government of Sir George Lloyd did not even wait till the scheme was finally sanctioned. The scheme was sanctioned in June 1920 whereas the appointment was made several months before, *i.e.*, in May 1919, and the agreement was actually entered into in March 1921. It again raises a constitutional question whether any appointment could be made with regard to a scheme before it is sanctioned (*vide* Council Report dated 17th March 1926).

(*d*) The agreement made with him offered him the most generous and unusual terms. The offer of 2 per cent. commission on all purchases made on his own recommendations is, to say the least, most unbusinesslike and almost inequitable. On an average the firm was drawing nearly fourteen to fifteen thousand rupees a month (*vide* annual Budget figure), *i.e.*, even more than the salary of the Governor, besides draining large amounts in big purchases such as Dredger, etc. According to the statement of the General Member, Mr. Cawasji Jehangir, on the transaction of Dredging Plants alone the commission earned by Messrs. Meik & Buchanan came to eight lakhs ninety-four thousand rupees (*vide* Council Report dated 13th March 1924, page 1157). This agreement was not even known to the members of the Council till about two years ago when the members in the Finance Committee came to know about it and subsequently it was disclosed to the Council.

(*e*) But the most objectionable part is that, in order to preserve the secrecy of these dealings and to avoid discussion about these large amounts paid as commission, this important item of commission was treated by Government as non-votable although under the rules all allowances and commissions are votable and must be submitted to the vote of the Council. This irregularity continued till 1924 when the objection was raised, it is believed, by the Auditor-General and hence Government was compelled to make it votable, *i.e.*, submit it to the vote of the Council. (Council Report March 13th, 1924, page 1155.)

Another circumstance in connection with Sir George Buchanan which the Committee may be interested to know, is the fact that his name has been recently removed from the Society or Association of Engineers in England of which he was a member. When questioned about it in the last March session of the Council the General Member first stated that he had no information on the subject but in the course of supplementary questions he admitted that his name had been removed but it was not known for what purpose.

These are some of the points that appear to a layman as needing investigation in connection with his appointment ; as it is now tried to be made out that he was solely responsible for this disastrous failure and it was due to his incompetency and ignorance, it becomes important for the Committee and the public to know as to who was primarily responsible for entrusting him with duties and responsibilities which he is now alleged to have been incompetent to discharge.

The Committee will also take into consideration the fact that he had just retired from Rangoon Port Trust service. By a lucky coincidence, this most lucrative post was created just at a time when he was relieved from his other duties and must have been on the look out for

some decent appointment. Nothing is known, so far as this scheme is concerned, about his other partner Mr. Meik, and the connection of Sir George Buchanan with that firm must have commenced shortly before or after the scheme was started. Did this firm crop up, as some others, along with the Development Directorate, or was he taken up in an old firm on account of his good fortune in securing this appointment as expert ? The name of Jacobs and Davies of New York must have been before Government as the experts of high repute who were consulted by Tatas and who had already studied this question. These reports were in Government files. Why were they not approached and why did the choice fall on an ex-Port officer of Rangoon ? Was it because the Government of those days were so keen upon starting this scheme regardless of the results or consequences that they did not want independent and competent experts apprehending that their reports may be unfavourable and the scheme may have to be dropped ? Was it with the same apprehension of receiving unfavourable criticism or adverse opinion that Government declined to consult any other public institution in the city or Presidency ? All the steps which might have hampered a hasty launching of this scheme were carefully avoided.

The public sincerely hopes that the Committee will carefully go into the question of appointment of Sir George Buchanan and fix the responsibility on proper head for this primary false step that has led to all this subsequent disaster and also pronounce an opinion about the agreement which read more like a contract with commission agents than with a consultant expert.

The point next in importance to the appointment of Sir George Buchanan as an expert, are the transactions about the dredgers " Sir George Lloyd " and " Kalu ". Enough evidence has been adduced before the Committee to expose these transactions which the Director once had the audacity to describe as a good bargain.

As in the appointment of expert, so about this purchase most indecent haste betraying some hidden motives is again exhibited. According to the information recently given by Chief Engineer Mr. Kerr, " Kalu " was purchased in November 1919, *i.e.*, about eight months before the scheme was sanctioned.

About twenty months after the purchase she was lying idle costing several lakhs of public funds on account of interest charges. Thus it is difficult to understand why Government was in such great hurry to complete this transaction even before the scheme was sanctioned. Like the appointment of expert, this was another unconstitutional and illegal step. According to the ruling of the President of the Council (*vide* Council Reports, Volume VI, Part II, 28th to 31st July, page 493) " Schemes must be brought before the Council before proceeding : that is constitutional way ".

Even the Port Trust authorities that had recent experience of its working was not consulted and what is worse still, that the experts Jacobs and Davies had already given their opinion that Port Trust Dredger would not be of much use for further reclamation as it had exhausted its usefulness (*vide* Billimoria's evidence, Development Committee's Report, 1914). The Dredger was admittedly not in working order as large amount had to be spent to get it reconditioned ; the negligence betrayed is almost criminal and there is no doubt that if Directors of a private company had caused such waste of share holders' funds, they would have been made personally liable and would have been made to pay damages.

No tenders were invited for such costly and important plants, although the success of the whole scheme entirely depended upon their efficient working. In the course of the proceedings of the Advisory Committee, it transpired that in America more efficient Dredgers are available for cheaper price, still no effort was made even to enquire from other countries or even from all the reputed firms of Great Britain. Still these transactions alone have brought a huge fortune to the Consulting Engineers, which perhaps Sir George Buchanan was not able to earn during his whole life. If " Kalu " was bought before the appointment of expert, is he entitled to any commission on that sale ? The following dates show that the local Government had committed itself to great responsibilities with regard to the scheme long before the final sanction of Government of India or Secretary of State was obtained—

The appointment of Sir George Buchanan by local Government, May 1919 ;

" Sir George Lloyd " purchased in December 1919 ;

" Kalu " in November 1919 ;

whereas the Government of India and the Secretary of State finally accorded sanction to the scheme on 4th May 1920.

Further information about Dredgers " Kalu " and " Zinga "

(For verification and use by the Committee)

Dredgers " Zinga " and " Kalu " bought by Bombay Port Trust from Simon and Co. in 1907. Cost of two dredgers Rs. 17,61,700. Spare parts Rs. 67,380. Guarantee given.

That they should be subject to a fine of £20 per cubic yard for any deficiency. That is, with 2 dredgers if the quantity of soft clay pumped, say, is 3,000 instead of 4,000 cubic yards per day, they will pay £20,000 fine. Soft clay does not mean liquid mud.

Actual maximum output was not more than 400 cubic yards per hour.

Both dredgers sold to Military for Mesopotamia in November 1915 for Rs. 7,80,000.

If this information is correct, Military bought "Kalu" and "Zinga" in 1915 for Rs. 7,80,000 and four years after that "Kalu" alone was bought by Government for £75,000 *plus* a large amount was spent for reconditioning.

After four years the value must have considerably depreciated. Still Government paid much larger amount for one only.

Had Sir Lawless Hepper anything to do with this transaction as the head of the Ministry of Munitions? As such, was it his duty to dispose of surplus military stores, and was "Kalu" part of such store disposed of by Military through the Minister of Munitions? Port Trust had taken a guarantee even when Dredgers were new. No such guarantee taken by Government for either of the two dredgers. Another grave neglect resulting in great loss.

Was any inquiry made from the Port Trust about the price they had received from the Military?

The Committee will be pleased to investigate as to how and through whom the final transaction took place between Military and Government (final cable, *vide* Council report, 17th March 1926, page 1367). This shows an absolute disregard to rules and constitution.

As regards the technical aspect of the scheme, it is difficult for a layman like me to express any opinion, still, having studied various records on the subject, some apparent defects even appear to an ordinary man in the street without any special professional or technical knowledge. A study of the procedure adopted by the Port Trust in carrying out their reclamation gives a good opportunity for a layman to have an idea of the subject. It appears that the method adopted by them was that in the first instance a very capable and practical engineer having experience of the particular branch of project is appointed for a thorough investigation and survey of the whole area by first taking what is known as preliminary or washboring and then further attempts are made to get more information about the exact nature of the sea beds by taking true or pucca borings, by even taking out material from the depth of the sea so as to enable them to find the nature of the plant required for the purpose of dredging. It is after this that the expert prepared a report and an estimate and submitted it for the consideration of the Government or the institution that has engaged him. So far as this scheme is concerned, all the Government and the expert had to go upon, was a few hundreds of what are known as "wash borings by Mr. Kidd in 1914". It is admitted that no pucca borings or survey was made nor was there any effort made to find out the nature of the material in the sea bed without which it is extremely risky to order out any expensive plant.

On this preliminary survey of Mr. Kidd, Sir George Buchanan is alleged to have prepared his report and estimates which were so readily and hastily accepted by Government and without knowing the nature of the stuff that would be dredged or the distance of the pipe line that would have to be laid, how can it be possible to know the exact type or strength of dredger to be ordered out? And when the mistake was discovered, instead of taking the public into confidence and confessing the great error they had already made, Government began a campaign of misrepresentation and tried to hoodwink the public by starting a false propaganda with the result that the original estimates first raised by 100 per cent. have now gone up to nearly 300 per cent., increasing proportionately the period of completion.

But leaving the engineering and technical points to be dealt with by competent experts on the Committee, I shall now endeavour to place before the Committee what I consider the proper sphere of a non-official witness, namely, criticism on internal administration or rather on mal-administration and the internal working of the scheme.

Even before I became a member of the Legislative Council, I had been directing my attention towards the various objectionable methods that were adopted by the administration in working out the scheme. The Committee will appreciate the difficulties under which a layman like myself had to struggle in order to have a peep behind the veiled screen, and my position will now be better appreciated in view of the fact that the Department has all along tried to maintain strict secrecy, not allowing what they consider to be departmental secrets to leak out of the happy family arrangement. Still by various means, by correspondence in press, by resolution in the Council, and by criticism during budget discussion, I have made every endeavour to lay before the public some of the grave irregularities in the procedure, which I have even characterized in the Council as well as on the public platform, as great public scandals. The Committee will also appreciate that allegations of this description, unless vigilantly investigated into immediately and promptly after they are made, it is not practicable and possible to detect the alleged frauds. When allegations are openly made, all parties concerned would naturally take all the necessary steps and precautions to destroy all the valuable materials in the shape of

documents and private records that would, in case of an immediate investigation, throw light on the subject.

It is a pity that public appeals to the local Government to start an investigation immediately after the allegations were made, and even a resolution of the Council to the same effect, fell absolutely on deaf ears and Government paid no heed to public demands or to the Council resolution. It is now nearly two years since that resolution was passed when these allegations were made and most of the officers concerned have left the service, as well as some of the firms have also severed connections, and hence it is extremely difficult to make an investigation at such a late stage to trace the facts.

In the course of a debate in the Council in March 1925, I had stated " without any reserve, with all the responsibility that I can command I openly make a charge that there has been a serious mal-administration of public funds and there has been a serious wasting of public funds. There have been instances which I can go to the length of calling frauds and I make this charge on behalf of the public and on behalf of investors of Bombay who have invested nearly 30 crores in this work. I say that if Government shirk an inquiry, suspicion in the public minds will be confirmed ". I further stated " I only want to know what is being done of the public funds : I want to know whether these funds are honestly and legitimately applied or whether they are misapplied. I may tell the Government quite frankly and openly that there are ugly rumours in the city and the whole of the Presidency that higher staff and officers have been receiving secret commissions from manufacturers and this is the reason why in this instance the department has incurred a loss of Rs. 3 lakhs. That is the reason why stores are indented in large quantities than are necessary and stores that are not required are also ordered out. If you go to the Surplus Depôt, stores worth Rs. 6 lakhs or more are lying undisposed of ". The last statement was re-echoing the ugly rumours that were prevalent throughout the city. As stated above if Government had conceded the public demand and started an immediate and prompt enquiry, there and then perhaps most sensational revealations might have been disclosed. But even at this late stage, I can place before the Committee all the materials that I have been able to collect not with a view or desire to cast any aspersion against any individuals of the department, but primarily with a view to enable an independent investigation to find out the truth, and if sufficient materials are disclosed, to take such action as the Committee thinks proper. All along my appeal to Government has always been for an investigation of certain allegations to find out the truth and in connection with this, as my statements in the Council and in public refer to the activities of the whole Development Directorate and not only to the Reclamation alone, the Committee will permit me to place all the materials before it in order to enable it to judge for itself whether I was justified or not in demanding a public investigation. Besides, the Committee is perhaps aware, at any instance the Municipal Corporation has passed a resolution requesting the Government of India to extend the terms of reference so as to bring within the scope and purview of the Committee, the other activities of the department also. Thus my statement on this subject may be taken in anticipation of this extension ; if not the Committee may eliminate that part of the statement which does not come strictly within the purview of the limited reference.

First and foremost, I wish to bring to the notice of the Committee a serious complaint that with regard to the working of the Development Directorate, particularly with regard to the works extending to lakhs of rupees carried out in connection with the reclamation and other activities, the Department did not observe the ordinary procedure of business and up till very recently did not invite tenders but favoured a few individual contractors with contracts of the said work at rates very exhorbitant and very favourable to contractors but causing great financial loss to the public.

I give you one important instance with regard to greater portion of the work of filling in. One Balkishan Seth *alias* Damodar Sheth was the most favourite contractor on this work, and as it now transpires, his previous record and history is rather interesting. This gentleman was formerly a clerk in a railway company in Upper India from which he was dismissed after being convicted for a very serious offence of fraud and cheating and sentenced to a long term of imprisonment. After serving his term, he came to Bombay to try and make a living as in his own province in Upper India, after the stigma it was difficult for him to earn a living. Luckily for him, just about the time, this work was started, and it is not known how, but by some means or other, he got himself ingratiated in the good books of the officers who exercised absolute discretion of giving tenders or contracts of the work of filling up. This gentleman accordingly became a great favourite of all the officers from highest to the lowest and in course of time, practically enjoyed the monopoly of this particular work and the works connected with it at rates which for want of competition were practically dictated by him and accepted by the staff. A comparison of the rates charged by him in the days no tenders were invited and the rates charged along with the tenders of others will clearly show my point.

As far as information goes this gentleman was once given Rs. 10 or more per truck of 19 or 20 tons for Colaba section filling in which was then reduced to Rs. 6 and then to Rs. 4-6-0. But after criticism in the Council it appears that circulars were issued in the Department directing that public tenders should be invited for all this sort of work, as a result of which this gentleman

reduced his rate to the last figure of Rs. 2-8-0 per truck making it at two annas per ton. Thus for exactly the same sort of work, and the former work was easier as trucks were directly emptied near the rails, whereas now it is a bit expensive as the materials had to be carried to a little distance from the rails, the same contractor who had offered and obtained the rate of Rs. 10 or more per truck was now prepared to work at the rate of Rs. 2-8-0 per truck.

It was elicited in the last Council that this gentleman had done the work to the extent of nearly 9 to 10 lakhs of rupees without tender at exorbitant rates and although he was practically a pauper when he came to Bombay to start a new life, to-day he is in affluenced circumstances.

But another important circumstance in connection with this work which occurred about a year ago, throws a good deal of light and shows the exact relationship that has existed between him and the higher members of the staff. As stated above, when the circular was issued that public tenders must be invited about ten months ago, several contractors sent in their tenders including the old contractor Balkishan Seth. On the day when the tenders were to be opened in the office, Mr. Thomas, Deputy Director, was in charge and he ordered all the other contractors and merchants to be out of the room when he opened contracts. The merchants protested and desired that the tenders should be opened in their presence but Mr. Thomas paid no heed and allowed only the old favourite contractor Balkishan Seth to remain in the room or to enter the room when he liked, whereas other contractors were strictly kept out. At this time Council session was proceeding and these contractors came in a body to complain to the Director, and incidentally mentioned the matter to some of the members also. They did make a complaint to the General Member, but it is not known what action the General Member took. It is also reported that amongst the tenders that were opened by Mr. Thomas in the presence of the favourite contractor and excluding others, the least tender was of another gentleman which was Rs. 2-8-0 and the another tender at the same rate was by strange coincidence of the same contractor Balkishan Seth. The allegations of the contractors were that Balkishan Seth was secretly informed about the lowest rate when the tenders were opened and was allowed to put in a tender with rate newly inserted.

Since then it is reported that the said Balkishan Seth has been struck off the list of contractors and is not allowed to put in any tender. The discovery is made too late and on account of this lapse or what appears to be a clear case of favouritism for reasons or considerations best known to the officers concerned, the public have lost large sums of money and an individual is allowed to profiteer at the cost of the public.

Similar favours were shown to the same contractor with regard to other contracts of painting work, etc. The Committee may inquire whether it is not a fact that when a circular was issued only about eighteen months ago directing that public tenders be invited for all works, thus admitting that before that all the work was monopolised by a few persons and competitive rates were not obtained.

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Similar favouritism existed in connection with the Kandivli quarries when one Mr. Palkar, a petty contractor of the Suburbs, was fortunate enough to get monopoly of contract for unloading materials from Kandivli quarries. In connection with the quarries, it was also elicited that the original estimate was for one lakh of rupees. It was ultimately raised to six lakhs and the other day you have heard the surprising statement from the officer in charge that the quarries were exhausted and that further areas would be required although the work of filling in has just commenced.

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Similar scandals existed with regard to purchase of stores, and I will give some of the instances that have come to my knowledge. In the course of proceedings, the Committee has already elicited a good deal of information on this subject which supports my allegations made in the Council that superfluous stores and plants costing lakhs of rupees were ordered out and which were not required and not capable of being of use, such as huge and costly navvies, cranes, etc.

In one instance, an Executive Engineer had prepared an indent to be forwarded to Manufacturers at Home for a large quantity of mild steel bars for concrete piles for the reclamation work and the size mentioned in the original indent by the Executive Engineer was 5/8". This figure was subsequently altered after the indent was prepared but before it was despatched by the Superintending Engineer into $\frac{7}{8}$". The quantity required was about 1,200 tons, costing nearly three lakhs of rupees. The indent thus altered was sent by the Superintending Engineer to the Home firm and the bars arrived of the size and dimensions of $\frac{7}{8}$" which were not required

for the works. They were deposited in Matunga Surplus Depôt and a fresh indent had to be sent with correct specifications and fresh consignment arrived, and the amount of nearly Rs. 3 lakhs of the first consignment was purely wasted. When a question was raised about it in the Council, in the course of debate, the Development Director admitted it but stated that the said alteration was due to a trifling error. No effort was made to explain how such "trifling error" could have occurred, particularly when the indent was originally correctly prepared by one Engineer and deliberately altered by the superior and no explanation was forthcoming. (*Vide* Council Report dated 24th October 1924, page 861.)

Further, in order to pacify the Council and to show that this trifling error had not cost any loss, the Director stated that there was no loss to Government and he gave the Council to understand that they were utilised in some other works and had caused actually a saving. As I knew that these bars which were recently indented were still lying in the Matunga Depôt, I caused enquiries to be made some months after the statement was made and sent an intending purchaser to make enquiries from the Matunga Depôt, as the result of which, the Executive Engineer, Housing District, wrote back offering these and other steel bars for sale and inviting the purchaser to the Depôt to have an inspection of the same. At the same time, the Stores Department also supplied the said purchaser with a list of the bars available for sale and in which list were also included some bars in question of $\frac{7}{8}$". This letter of the Executive Engineer inviting the purchaser for an inspection is dated Matunga, 26th January 1925. Further comments on such an attitude are needless, and I leave it to the Committee to draw its own conclusion.

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Now coming to the establishment, the Committee will find that this Department was one of the most extravagantly paid departments of Government, and apart from the number of superfluous posts, the salaries as compared with similar offices in the Public Works Department were greater. At the time of the introduction of the Bill in connection with the work of the said scheme, it was stated that the scheme would be carried on by monies raised from Bombay, which will be spent in Bombay and for Bombay, whereas if you look at the list at a particular time, of the high-salaried officers, at one time it was elicited in the Council that out of 20 posts carrying salaries of Rs. 2,000 and upwards, there were 19 Europeans and foreigners and only one Indian. though several Indians with English and better qualifications were available and though they were willing to serve on lower salaries, their claims were set aside in favour of foreigners.

In this connection, it would not be out of place first and foremost, to mention about the Director himself who carried a salary of Rs. 6,000 which was the highest salary next to the Governor in the province and is provided with a Bungalow which cost 3½ lakhs. As a result of repeated protests, the salary was only about two years ago reduced to Rs. 4,000. How was he qualified to be at the head of the largest work of reclamation in the world ? Had he gained any experience or knowledge on this special subject in the course of his duties as an agent, G. I. P. Railway, or as Controller of Munition Board? He disowns all engineering responsibility, hence his duties mainly were only administrative, *i.e.*, similar to those discharged by the Chief Secretary, Public Works Department, with some additional autocratic powers. The Secretary's salaries usually do not exceed Rs. 2,000. Then why was he favoured with such an extravagant salary of Rs. 5,000 with a commodious palatial bungalow worth 3½ lakhs? Even the General Member who was supposed to be the head and controlled several other departments besides, got a salary less than the Director. Similarly, one Mr. Thomas, who has already given evidence before the Committee, but who did not inform you of his engagement prior to his being taken up by the Development department, according to the information received, was a mere draftsman or foreman, carrying a salary of Rs. 400 to Rs. 500 in one of the local firms, probably James Fowler & Co., and from there through some influence, he was elevated to the very high salaried post and in a short time came to occupy the most responsible and well paid post of Deputy Director. It would

also be interesting to note and find out whether James Fowler & Co. were amongst the list of firms who supplied stores to the Department.

Similarly, with regard to several other posts, gentlemen with meagre or no qualifications were provided with fat and high salaries either as deputy or assistant engineers. It would be interesting to find with regard to most of the officers carrying salaries of Rs. 2,000 and upwards as to what appointments they held immediately prior to this and what were their salaries.

It is stated that Mr. Harvey, the Superintending Engineer, was formerly getting only about Rs. 900 in Delhi and Messrs. Sykes and Lewis and one Mr. Lowe all came from the same place at the same time. It seems the whole group was bodily transferred from Delhi to Bombay. One Mr. Mitchel getting Rs. 2,000 and his sole business was mostly to test cement, as if this work required a special officer of a large salary and could not be entrusted to any other Engineer. Deputy Chief Engineer Mr. O'Rorke, drawing a salary of Rs. 2,100, was stated to be a lieutenant Port Trust Officer at Mesopotamia drawing a salary of Rs. 700 or Rs. 800. Executive Engineer Mr. Gardner, similarly highly paid, was a captain in Mesopotamia on a salary of Rs. 500. One Mr. Roberts, getting a fairly high salary, was stated to be a policeman in Wales during War time and thereafter engaged in some State quarry work on a very low salary.

These are some of the instances how this Department was used as a dumping ground for providing fat salaried posts for a number of officers at the cost of public funds. Government seems to have treated the Department as a convenient asylum for retired gentlemen. Sir George Buchanan, retired Port Engineer, is accommodated as a Consulting Engineer. Sir Lawless Hepper, retired agent to a Railway Co. and retired Controller of Munitions, becomes Director with fat salary of Rs. 6,000, and a Bungalow worth Rs. 3½ lakhs. Other batch of gentlemen come from Delhi perhaps retired or their services terminated on completion of works. Some Military gentlemen are awarded with high salaried posts perhaps in return for valuable services during the War. And to complete the list, the Dredger "Kalu," superannuated and exhausted is dumped on to the Department, a retired plant to be worked by retired gentlemen.

Another transaction of the Directorate which has resulted and will continue to result in very serious annual financial loss is the agreement with four different cement companies giving them under certain agreement contract of supplying all the cement required for the various works including reclamation, the combined output being up to 60,000 tons per annum.

The said agreement is made by the Development Directorate with four cement companies Katni, Bundi, Jubbulpore and Dwarka Cement companies whereby these companies are given the sole monopoly of supplying all the cement required up to 60,000 tons per annum for ten years commencing from 1st September 1922, at a rate equivalent to 90 per cent. of the actual cost of cement in the financial year of the company concerned preceding the season in question *plus* 15 per cent. According to this term, cost to the Government of cement came to from Rs. 60 to Rs. 70 per ton.

Shortly after the agreement was executed, the price of cement began to fall considerably till in 1923, it came at one time to Rs. 40 per ton and in 1924 even from Rs. 40 to Rs. 30 per ton and the rates were particularly low for large quantities. At a difference of Rs. 30 per ton the total difference for 60,000 tons, the full requirement of the Directorate would come to Rs. 18 lakhs a year and if the rates remain the same or go lower still in the course of ten years, *i.e.*, the full period of the agreement the total loss would be one crore and eighty lakhs. Besides this, annas 14 per ton are spent for testing the cement supplied. Thus in one transaction alone the Directorate would sustain a heavy loss of 1½ crores rupees and to that extent the four companies concerned will be benefited at the expense of the public. This agreement binding the Directorate for such a long period was made at a time when every shrewd man of business in this line knew that there was bound to be a slump in trade in this particular commodity and even from the year 1921 the slump had commenced in Europe and America and the prices were rapidly going down.

About two years ago, one of the contracting companies expressed its inability to continue the terms of agreement and by an arrangement with the Directorate, the benefits accruing to that company were transferred to another company for consideration. Thus the Directorate instead of availing itself of the opportunity of reducing the liability, again deliberately renewed the agreement with another company.

Another way of saving enormous loss to public funds was to allow contractors to buy cement cheap from the market as there was nothing in the agreement to compel private contractors to buy cement under that agreement; still, it is reported that the Directorate compelled the contractors also to buy at these rates from the four companies alone. Thus in this case too, as in other instances previously mentioned, greater solicitude is shown for the interest and benefit of private companies or individuals regardless of the consequential loss to public funds.

Another query from the public raised through the press and which has yet remained unanswered is to the effect that in beginning large consignments of plants and machinery intended for the Development Directorate used to arrive in the name of Sir George Lloyd, the Governor personally and not in the name of Government of Bombay or the Development Directorate, thus raising a presumption that orders were sent in his name. A well known

publicist of Bombay had repeatedly asked these questions through the press whether that was a fact and if it was, what was the explanation for it.

These are some of the materials and information that I had with difficulty gathered from various sources and considering these materials *prima facie* sufficient merely to start a public investigation either to have them verified or falsified, I moved a resolution in the Council in October 1924 demanding a public inquiry. That resolution though passed by the Council in spite of strong Government opposition, was completely ignored and the issue was sought to be side-tracked and clouded by inviting some members to join the impotent and powerless advisory Committee. The next occasion to discuss the subject was March 1925, when I strongly criticised the attitude of the Government in not even permitting an investigation on behalf of investors who had invested thirty crores of rupees and repeated the charges of mal-administration and waste of public funds and described in some instances as frauds. I also frankly warned the Government about ugly rumours that were current in the city with regard to extravagant waste of public funds by ordering out plants, machinery and materials valued at lakhs of rupees that were not required and could not be used for the Department. The letter dated 26th January 1926 from Stores Department shows that on that date these unused mild steel bars were in the Matunga Surplus Depot of the value of about 4½ lakhs of rupees for sale. Before that, how many were disposed of is not known. This is only one instance with regard to which an admission is accidentally obtained from the department. Similarly, other large stores of the value of lakhs of rupees were lying in the Depot unused and getting rusty.

The question naturally arises, as to why such large quantities of superfluous stores ordered when admittedly they were not required and not used ? And who ordered them out ? Coupled with that, we have one instance where an Indent is altered by a Superintending Engineer. Other grave scandals were, favouritism and patronage shown to particular contractors, who were given rates five times as much as competitive rates secured by open tenders for the same work, and the very contractor is subsequently prepared to carry out the work at that extremely reduced rates. Why were such huge profiteering intentionally allowed to particular favoured individuals causing enormous loss to public ? It could not be merely on account of friendship as no friendship could exist between an Indian convict and high European officials. Then what was the other consideration for such favouritism ?

The Committee while dealing with these questions will realise the grave financial loss not only to the city but to the whole Presidency. This mad and chimerical venture has practically mortgaged the resources of the Presidency for at least a generation to come. All other schemes of public utility, even such as primary education and medical relief must be suspended till the huge gap in the Bombay treasury is filled up.

According to the last Budget, three crores are to be funded, *i.e.*, twenty lakhs every year for the next thirty years are going to be set aside for paying the loss on the Back Bay Reclamation. This is no doubt a modest estimate to prevent a scare and panic in the public ; ultimately it is bound to be much more and all this on a Province that is already most heavily taxed and most heavily burdened with loans. The incidence of taxation per head of this province is higher than other provinces and the debt charges are more than two or three other provinces put together.

In connection with this Investigation, before closing my remarks, I may be permitted to refer to some of the sections and rules laid down in the Government of India Act that appear to me to be relevant and useful in fixing the responsibility. Under Auditor General's Powers, Part II, Duties and Powers as regards Audit, the following canons are laid down (page 141, Government of India Act, 1919) :—

> 10. (1) Every public officer should exercise the same vigilance in respect of expenditure incurred from Government revenues as a person of ordinary prudence would exercise in respect of the expenditure of his own money.
>
> (4) Government revenues should not be utilized for the benefit of a particular person or section of the community.

Thus the standard laid down to be observed by a public officer when dealing with public funds is very high. The question is whether the officers, from the highest to the lowest, concerned have exercised same vigilance as a person of ordinary prudence in respect of his own money. In view of the revealations and disclosures made before the Committee during the last few days, there could be only one reply to the above query.

Further rule 37, Devolution Rules, lays down the function of Finance Department :—

> 37. The Finance Department shall perform the following functions, namely :—
>
> (*a*) It shall be in charge of the account relating to loans granted by the local Government and shall advise on the financial aspect of all transactions relating to such loans.
>
> (*d*) It shall examine and report on all proposals for borrowing by the local Government ; shall take all steps necessary for the purpose of raising such loans as have been duly authorised ; and shall be in charge of all materials relating to the service of loans ;

(*e*) It shall be responsible for seeing that proper financial rules are framed for the guidance of other departments and that suitable accounts are maintained by other departments and establishments subordinate to them;

(*g*) (*iii*) It shall examine and advise on all schemes of new expenditure for which it is proposed to make provision in the estimates and shall decline to provide in the estimates for any scheme which has not been so examined.

Therefore under the circumstances disclosed, the Finance Department of the Government of these days cannot entirely be exonerated and further Section 124 of the same Act (Government of India Act) also defines certain Acts which constitute misdemeanours on the part of any person holding office under the Crown :—

(2) If (except in case of necessity the burden of proving which shall be on him) he wilfully disobeys or wilfully omits, forbears or neglects to execute any orders or instructions of the Secretary of State ; or

(3) If he is guilty of any wilful breach of the trust and duty of his office.

If these wholesome provisions of the Imperial Act, introduced for the safety of public funds and to secure due discharge of public duties, are not merely ornamental dead letters, but are intended and meant to be used on proper and fitting occasions, then my submission to the Committee is that there never was, nor ever will arise a more befitting case for the operation and application of these sections to this most cruel act of vandalism on the part of the Government of Sir George Lloyd. That course alone will satisfy public demand and restore both public confidence and Government's prestige. If private trustees had played such havoc with funds entrusted to their care, there is no doubt that they would have been made to answer in a Court of Law and compelled to make good the amount. Public also expect a higher standard of morals, vigilance and prudence with regard to public funds.

Extracts from the Report of the Bombay Development Committee, 1914

Extract from the Statement of Cowasjee Jehangir (Junior)

29th November 1913.

From the above it will be seen that I am of opinon that any reclamation scheme is at present premature. Such a scheme, if decided upon, would only provide residential quarters for the better classes. From figures already before the public, if the big scheme is carried out as proposed by Government, land will cost Rs. 25 a square yard. I would ask the Committee to consider what the rents for the houses would be, if the reclamation is not to become a huge flat-land. I would think they would be somewhere near Rs. 300 a month. I have already mentioned above that a certain percentage of flats in and round and about the Fort are always vacant. I therefore do not consider that there is any great demand for flats of this rent.

I am strongly of opinion that looking to the way in which investors have burnt their fingers on the Cuffe Parade, where I believe, there are some plots still unlet the public will not come forward in any numbers to build on the proposed reclamation. I admit that having an extensive park and recreations grounds is the only tempting part of the scheme. But before Government decide upon launching upon so ambitious a programme, I trust they will seriously take into consideration whether the development of other parts of the island would not suffice for our needs, for at least a couple of generations to come. If the efforts of the Corporation in mitigating the nuisance of the Love Grove Pumping station be unsuccessful, the question of removing the pumping station must seriously be taken into consideration, or perhaps a reclamation scheme in Section might become advisable.

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Letter from Jacobs and Davies (Inc.) to Ratan Tata, Esq.

March 21st, 1911.

RATAN TATA, ESQ.,
Hotel Winter Palace Menton, France.

Dear Sir,

We must thank you for your courtesy in allowing us to see the latest Government scheme for the increase in the available area at Bombay by reclamation. The pressure on the available area at Bombay is in our opinion somewhat severe ; and yet we are inclined to think that local opinion rates this pressure as more severe than it would appear to be to a disinterested

outside observer. In illustration of this we have prepared the following table, giving a comparison of the density of population in a few large cities chosen for their general familiarity: —

City.	Population. No.	Population per sq. mile. No.
Bombay	8,00,000	38,100
Calcutta	1,027,000	42,800
London (Country)	6,300,000	46,700
Paris	2,800,000	90,000
Berlin	2,100,000	95,000
New York (Manhattan)	2,365,161	108,000

Although this was not known when choosing the examples it is seen that Bombay has the lowest density of population of any, even though the great bulk of inhabitants are natives of the country, who can live in comfort under conditions of crowding that would be intolerable to persons of other nationalists.

In our opinion land values in Bombay do not really reflect local conditions of congestion, and we believe there is still plenty of room for expansion within the present city limits. Very few cities in America where land values are higher than at Bombay, and whose populations are increasing at a vastly higher rate than Bombay's, have gone to the expense of adding to their areas by reclaiming land from the water fronts on which they usually lie and which are also the sources of their importance and growth.

To add a few acres here and there as opportunity serves and in places where exceptionally favourable conditions exist, is one thing; but at one fell sweep to alter entirely the whole lay-out of an important city and add large acreable in the way proposed serves only to dislocate and depreciate present land values of numerous land owners and to create chaotic general conditions which are likely to do much more harm than good. In our opinion this huge scheme is unnecessary and chimerical to the last degree.

All this is entirely beside the question of whether the work can be done for the sum estimated by the Government Engineers, which from the data collected on the ground last year by our representative we consider is in the highest degree improbable and we may even say impossible.

During the progress of the work, which it is safe to say will take much longer than the estimates would lead one to believe the extremely unsightly appearance of the whole area undergoing reclamation will spoil the entire appearance of the city in which her more enlightened citizens take so much just pride and will defeat its very object until Nature has had time to cover up the traces of man's handiwork.

As pointed out to you in our report of last May the large Sewree Reclamation will remove from Colaba much of the objectionable business now carried on there, leaving this section free for its orderly and natural development as a residential locality.

We think that Government has got hold of the Reclamation idea and has run it to death without fully balancing in all their aspects what benefits and what harm will accrue to the city by this gigantic piece of meddling with the natural situation.

We have spoken our minds quite unreservedly on this matter, and perhaps more forcibly than we would have done in an official and formal report, believing that what you desired was not such a report, but merely a personal and thoroughly frank expression of opinion.

Yours faithfully,
Jacobs and Davies (Inc.)
(Signed) CHARLES M. JACOBS,
President.

Report on Reclamation Scheme in Bombay

By Jacobs & Davies (Inc.)
Per B. H. M. Hewett. *Bombay, May 1910.*

Sir,

In accordance with your request I have the honour of submitting the following report upon the abovenamed subject on behalf of and subject to the approval of Messrs. Jacobs and Davies of New York City.

* * * * *

8. These facts though no doubt familiar to you are set out here to show that suction dredging in the Back Bay Area itself with a view to setting the shore line further into the bay has several local features somewhat against it, *viz.*, the dredges could only work in certain places and even so until they had cut channels of sufficient depth and width to give themselves room

for flotation and handling work could be done only when the tide was high enough to float the plant; also the depth of fill averages 20 feet, so that not only is there a considerable head against which to pump but also a comparatively large quantity of fill is required for every unit of area reclaimed. The fact that a rise and fall of tide of some 16 to 17 feet is found here also has a bearing on this question. The south-west monsoon which lasts four months a year also comes directly into this bay, which faces due south-west.

9. Keeping these facts in view, estimates have been made on the basis of obtaining the filling material from elsewhere for the purposes of filling large areas and depositing it in several different ways which will be described later.

10. Some attention was given to a proposal to dredge the filling material from the flats of Uran on the eastern side of the harbour, tow the excavated material round in barges, deposit it in the Back Bay and repump it, by suction dredges, behind sea walls previously built to retain it.

This Scheme appeared attractive at first but there would be many difficulties connected with the towing of the barges into the Back Bay. The low water difficulty would still have to be got over and it is likely that many delays would arise owing to the difficulty in entering the bay, as there is a reef extending from Colaba point to Malabar point with only one narrow entrance near the Malabar point.

Another scheme which has been worked out is to dredge the Uran mud flats, as before, bring the material to the Sassoon Dock, elevate it and repump it across the spit and along the present shore front and finally discharge it at the required point, behind retaining walls previously built. This is perhaps a more practicable method than the first mentioned one, though the expenses of the relay pumping is high.

11. Yet another plan has been considered as an alternative to the Back Bay Dredging. This is to obtain earth from hills (such as those at Andheri) near the B. B. & C. I. Railway. This earth would be excavated by steam shovels, loaded direct into wagons and brought down on the Railway diverted on to a specially built siding and then dumped by means of automatically acting "brudges" or other such contrivance. This scheme has several points in its favour. The work need not be stopped altogether for the four monsoon months and the work in general is free (except for the bulk head wall) from the uncertainties of marine work.

12. There remains yet the question of dredging the Back Bay itself and making the fill with the dredged material. There is no doubt that if the supply is sufficient (which it would be for the moderately sized reclamation) the quality of the material is excellent, far better than any thing which would be got from Uran, as the latter is a thick black sticky mud which would need mixing with something more solid and probably a liberal topping of murum before the filled in area could be used, while the Back Bay material is a good fine sand which would need much less finishing off. As a result of borings taken in the Back Bay it is estimated that there are 12,500,000 cubic yards of materials which could be dredged.

13. The different methods of making the fill have been worked out as to cost and it appears that they all seem to give figures which closely resemble each other and seem to be (for comparatively small areas) about Rs. 20 per square yard of area recovered. Small areas are relatively more expensive than large as the wall work then begins to take up a greater percentage of the whole cost.

14. The wall work is not the smallest part of the problem and in the estimates it has been assumed that it would be necessary to provide a temporary dam wall round the site to be reclaimed. This wall would keep out the water and the work of building the permanent sea wall would go on inside this dam which would not be removed until the fill was finished and would protect the work before it was completed against the monsoon. This makes the wall work comparatively expensive and it might be cheaper if there were a sufficient depth of sand (as there is at Chowpatty) to drive steel sheet piling or concrete piles as a core and build the permanent wall direct around this core. A great deal would depend on the depth of rock below the present sand surface on the wall line. The depth of sand is greatest at Chowpatty where the borings went to 25 feet without trouble and gets less and less as one gets further south. At Church Gate only 8 feet is found; to south of that the wall would be on rock. Reliance cannot be placed on steel alone for the wall, as experience shows that its decay is extremely rapid in the water of Bombay.

15. Several different schemes of reclamation, *i.e.*, different as to the area to be reclaimed, have been worked out for the Back Bay District and the best method or combination of methods which it would be best to adopt would depend to a great extent on what area was to be reclaimed and the locality of the area. For example, a large area of reclamation at Colaba would need different treatment from a small area at Chowpatty.

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12th December 1913.

Examination of A. J. Bilimoria of Messrs. Tata Son & Co. (Questions by Honourable Mr. Phirozshah M. Mehta.)

Q.—Now I come to what I consider the most important part of the evidence. The Chairman has told you we are not considering the Reclamation scheme, but still there is a lot of evidence

on record giving opinions one way or another. Mr Bilimoria, you have had a very long acquaintance with the landed property in the City as you were managing from very early days all the properties of the late Mr. Tata and not only were you managing them but you were instrumental in acquiring and leasing several properties ?

A.—Practically all the buildings were erected after I joined.

Q.—So you are thoroughly conversant with land transactions in the City of Bombay ?

A.—Yes, fairly.

Q.—Now Mr. Tata, as you are already aware, always looked at a thing very thoroughly and made careful enquiries and he was always in the habit of employing the best of experts he could get. As regards the Hydro scheme, the Iron and Steel Co. and so forth, he always laid stress upon employing the best experts on any particular subject. I suppose in the same manner, he employed competent people to study the Reclamation scheme.

A.—These particular people were not employed by the late Mr. Tata but by Mr. Ratan Tata.

Q.—And they were very eminent people ?

A.—I suppose they are the best firm of reclamation Engineers in the world.

The Chairman.—Who were they ?

A.—Jacobs & Davies of New York City.

The Chairman.—Did they come out here ?

A.—They sent a representative, Mr. B. H. M. Hewett.

The Chairman.—How long Mr. Hewett was here ?

A.—About three months. He actually made ten or twelve schemes of reclamation on the western fore-shore and at Dadar and Matunga where Mr. Tata has got a large area of land and he gave us detailed costs of all the schemes.

The Chairman.—He made 10 or 12 schemes in three months.

A.—Yes ; I think in three or four months. The report was not given by Mr. Hewett as representing Messrs. Jacobs & Davies. They sent in their report after considering all the facts laid before them. Mr. Hewett turned out all the schemes in three months.

Sir Pherozshah.—Those schemes related to the whole of the western fore-shore ?

A.—He took them by bits ; Chowpatty for instance was taken in two or three ways for reclaiming. Then he took Marine Lines to Back Bay Baths. Then he took Marine Lines in another way. So it was worked in different ways.

Q.—I see, Mr. Bilimoria, when you say different schemes, some of them you mean were schemes working on the same basis but on different methods ?

A.—Not one full scheme, but in certain sections and by different methods of reclamation.

Q.—Then you are able to say from the reports which the firm you employed made that the figures in their estimates and those put forward in the Government estimates differ very largely ?

A.—Yes. They very considerably differ, and we sent them the Government estimates too later on, and we had report from them again.

Q.—I see that you go so far as to say that when the Government Engineers' estimates were sent to them, they thought it was almost improbable or even impossible to do it within their estimates ?

A.—Yes.

Q.—They were of opinion that it would take a very much longer time to perform the work by the Government Scheme ?

A.—Not only reclaiming. For instance, the life of the dredgers, they said, was not so very long. As a matter of fact they told us that the dredgers of the Port Trust were also coming to the end of their usefulness. Mr. Hewett told us that the dredgers of the Port Trust if utilised for the reclamation would not last long, they would not go on for ever.

The Honourable Mr. Sprott.—No, I don't suppose they will last for ever. Was it their opinion that the Port Trust Dredgers would not have a life sufficiently long if they are employed ?

A.—They said they could not be utilised for the proposed new reclamation scheme.

The Honourable Mr. Sprott.—They also referred to the Port Trust dredgers. Was it their opinion that the Port Trust Dredgers would not have a life sufficiently long to carry out the work which, I may say, they have already done ?

A.—We had been told that it was considered that these dredgers might do for some other purpose.

Mr. NARIMAN'S Supplementary written statement dated 23rd August received on 24th August 1926

As desired by the Chairman in course of my oral evidence to supply further particulars about irregularities, etc., if within my knowledge, I beg to submit the following supplementary statement.

Besides the instance of dry filling in contract given at page 19 of my written statement, I had referred at page 21 towards the end that " similar favours were shown to the same contractor Balkishan Seth, with regard to other contracts of painting, etc." I beg to submit the following further particulars :—

Last year or year before contract for painting pontoons was given to the same contractor, Balkishan Seth, and the cost on that item came to over a lakh of rupees. This year, tenders were invited for the same work and the cost came to about Rs. 53,000. Thus about half a lakh of rupees were paid extra for the same work without tenders.

Again at page 22 of my written statement I have stated that " similar favouritism existed in connection with Kandivli quarries where one Mr. Patker, a petty contractor of the suburbs, was fortunate enough to get monopoly of contract.....". With regard to that I beg to submit the following further particulars :

That in or about September 1922, Mr. Patker's tender for 13 annas per ton for quarrying rubble, etc., was accepted although there were other tenders of lower rates and the lowest o under 9 annas per ton was rejected. Since then Mr. Patker enjoys the monopoly of the work.

Similarly, in March 1925 Mr. Patker's rate for excavation only was Annas 10 per ton and subsequently on account of the agitation it was reduced to Annas 8 per ton. The present rate after public tenders for excavation as well as freight, is Annas 10-8 pies per ton. The freight costs about 50 per cent., hence the excavation alone, according to the present tender rate, comes to about Annas 5 per ton, whereas Annas 10 were given for the same work to Mr. Patker. The total amount of contract work done by him comes to Rs. 5 or 6 lakhs.

Besides this, the contractor was allowed free use of plants and tools of the Department such as Cranes, etc., and according to my information the working and maintenance charges, even during the period the crane and tools were used by contractor, were paid for by the Department. These charges alone came to about Rs. 1½ lakhs.

This irregularity of giving work to Mr. Patker without tender was also brought to the notice of Government, but I am given to understand that Government condoned this irregularity on the part of the Chief Engineer but issued memorandum in November 1925 directing that tenders should be invited in future. There was a memorandum also with regard to the use of plant and tools free of charge by the contractor.

That Mr. Patker has made huge profits on account of this monopoly, is evidenced by the fact that recently, *i.e.*, after these contracts, he has bought several valuable properties at Bandra including a bungalow at Bandra Hill worth about a lakh of rupees and another for about Rs. 80,000 besides two or three other smaller properties. Before that, he was a small contractor in the suburbs.

I hope you will place these particulars before the Committee supplementing my written statement.

Hoping to be excused for the trouble.

(Mr. Nariman's oral evidence)

The Chairman.—What is your full name ?

A.—Khurshed F. Nariman.

You have discussed the subject under three heads, Constitutional, Financial and General (including administration and management) ?

A.—Yes.

Q.—" Constitutional and Financial " refer to the origin as well as conduct of the scheme ?

A.—Yes ; Constitution does affect the conduct.

Q.—Our terms of reference, as you know, are to enquire into the history of the inception and conduct of the Back Bay Reclamation scheme, and secondly, to make recommendations as regards future operations. You have made a few casual statements regarding the recommendations you have in view. Before we close the evidence we might want you to specifically state the recommendations you wish to make.

A.—Very well, Sir.

Q.—You have given us a large number of instances of alleged irregularities and neglect. We should be glad if you would give us some further details with your explanations where necessary.

A.—You want me to confine myself only to the Reclamation scheme ?

Q.—We have no instructions to go beyond our terms of reference.

A.—With regard to that I must make my position clear. I understand that the Director was questioned with regard to the allegations made by me as to what was his opinion about the allegations and he said that according to his opinion they were false. I understood that reference was to my allegation with regard to the whole management of the work. I have never made any separate allegation with regard to the reclamation. I have always dealt with the Directorate as a whole.

Sir Frederick Hopkinson.—You are doing in this statement ?

A.—In this statement I have referred to several irregularities.

Q.—To the Back Bay ?

A.—To the Back Bay also.

Chairman.—We will only ask questions about the Back Bay.

A.—May I point out the particular irregularities which in my opinion relate to reclamation alone, leaving out the rest ?

Q.—In your statement, you don't devote many pages to the other irregularities ?

A.—There are several instances, particularly with regard to chawl contracts and stores ; I suppose I cannot go into them.

Q.—I believe the stores are included ?

A.—Partly.

Sir Frederick Hopkinson.—We want to hear nothing but what refers to the Back Bay.

A.—That very much limits my scope, but if that is the ruling, certainly I have to confine to that alone.

Mr. Billimoria.—That is the scope of the enquiry ; we cannot go beyond that.

Witness.—I may point out the Corporation has passed a resolution, at my instance, requesting the Government of India to extend the scope of your reference. If, in anticipation of the extension, you are prepared to take my statement as a whole.

Chairman.—We cannot go into that as a whole.

Witness.—I must tell you frankly that that very much limits my scope so far as the statement is concerned. I must confine myself according to the ruling of the committee.

Q.—You began with a statement on the constitutional aspect of the question. You were opposed to the creation of a special Development Department ?

A.—Yes.

Q.—As you thought it was a serious encroachment on the constitutional rights and privileges ?

A.—Yes.

Q.—Why should not Government start a separate department for a separate work ?

A.—I think that is against the constitution as laid down under the Act. Under the Act, as I pointed out, certain activities of the Government are made transferred subjects and as such they would come directly under the control of the Council so far particularly as finances are concerned. In this case, the financial control of the Council which constitutionally is the privilege of the Council, is taken away by what I have described as a manœuvring in legislation.

Q.—Did you raise that question in Council ?

A.—I was not there when it was introduced, but the first effort of mine when I joined the Council was to have this department abolished and have it transferred to the P. W. D.

Q.—I am not asking about the abolition of the department ; I am asking whether the legal point you are raising was raised by you as a member in the Council ?

A.—It was raised in the course of the several discussions, I believe in my resolution about the general enquiry into the activities of the Directorate. I have referred to these points. I have also sent resolutions about this question which were not ballotted. You know when you send in resolutions they have to be ballotted ; certain resolutions only can be discussed, the rest cannot be brought in ; and only a few days are allotted for discussion.

Q.—What makes you raise this question of constitution at this stage when you did not raise it in the Council ?

A.—I did try to raise it. But this is the first opportunity that Government has given us to raise this question at all. We have been clamouring for an opportunity. There was a resolution in October 1924. Even that might cover this question also. It was as under :—"This Council recommends to Government that a committee consisting of 12 non-official and elected members be appointed to enquire into the whole administration and working of the Development Directorate, to suggest ways and means of effecting retrenchments and to report on the advisability or otherwise of continuing the schemes taken in hand ; that the Development Directorate be requested to co-operate with the said committee and afford all facilities and help in

conducting the said enquiry and in making the said report." To my mind, we could have brought this question even if the Government did not give effect to the resolution in spite of the Council passing it by a large majority; that opportunity was also lost. This resolution was passed in October 1924 and was not given effect to by Government in spite of repeated requests and demands.

Q.—You mention certain constitutional irregularities in the inception of this scheme ?

A.—Yes; I would like to ask, if it is within the purview of this Committee, whether this creation of the department, under a special act, was not *ultra vires*, if the Government of India Act gives constitutional rights to the Council.

Q.—You could raise that question; we have noted it; we cannot say what recommendation we will make on it. You think, when introducing this bill to create a new department, the object was to remove the trammels and control of the legislative council ?

A.—That was what His Excellency Sir George Lloyd said while introducing the bill. I think it was referred to in the Corporation statement, " that a project of this description in order it may be expedited should be as little hampered by outside control as possible, and in order to remove that control we want a special department and thus make it a reserved subject ". That was in His Excellency's first speech. And he has referred to it subsequently too.

Q.—And then you end that recommendation on page 2 of your notes, " My submission is that the first recommendation should be to deprive the executive of these special extraordinary powers and transfer the rest of its activities to P. W. D. and thus restore the supervision and control of the Council " ?

A.—That is my first recommendation. I should say now that both on constitutional grounds and on point of expediency, and in view of the experience we have gained, I do not think that the department should be entrusted any more with the conduct of the scheme.

Q.—Was there a public demand at the time the scheme was originated ? Were the public in favour or against it ?

A.—So far as the Council report shows, there was not any serious opposition, and that was due to the misleading figures and very tempting profits being shown by responsible Government officials, and the gentlemen who did not oppose the scheme in the Council, when questioned subsequently, explained that their conduct was due to the fact that they were misled by very tempting calculations and reports of huge profits that the scheme was going to make, and they took it for granted that what was stated by responsible officials was correct. If they had doubted it then, they would have opposed it.

Q.—But the scheme was expected to prove a productive undertaking ? The public also had great hopes ?

A.—According to the Government statement. On that statement the public were taken in, I would say.

Q.—You are judging the conduct of affairs in a year of boom, after years of adversity ?

A.—That is true.

Q.—The conditions are different from what they were then ?

A.—I make allowances for that.

Q.—The Government also went with the public ?

A.—I do not agree; the public were duped by Government. If it was not for the statement of Government officials and responsible members that after calculation and meditation they have come to the conclusion that the scheme was going to be a huge success, had it not been for the statement of these officers there would have been opposition in spite of the boom.

Q.—You know people went crazy for land in those days ?

A.—I think that craze came a little later on, not at the time the scheme was introduced.

Q.—There was no inclination on the part of the public to disown the scheme ?

A.—Not at that time, disown in the sense that the public had nothing to do with it. It is all a Government affair, the public were not consulted, the public were not associated in it.

Q.—Before the Reforms the public were not consulted ?

A.—Even after that. In 1919 was the Government of India Act, and in 1920 was the scheme introduced.

Q.—It was discussed informally before ?

A.—Yes; after that came the public demand of various associations to be associated in the scheme.

Q.—You have made a large number of allegations. You ought to remember the main causes of failure; in considering the details we may forget the main issues.

A.—Yes.

Q.—The chief reason according to you was that the usual checks, constitutional, financial and technical, were set at nought, that is your main contention ?

A.—Yes ; if those checks were allowed to exist, probably this disaster might not have happened.

Q.—That is your contention. You also say that the responsibility was not definitely fixed ; it was not known whether the Development Directorate or the Consulting Engineer or engineers were responsible for it ?

A.—So far as the Council was concerned, it was disclosed that the whole thing rested with the Consulting Engineer till a very late stage.

Q.—You also complain that the technical supervision of the regularly constituted department was withdrawn ?

A.—Yes.

Q.—That was another drawback and one of the causes of the failure or partial failure ?

A.—Yes.

Q.—You say the chief causes are two, the failure of the dredgers to give the required output and the fall in land values. If the price of land were very high now, your criticisms would have been in a very different tune ?

A.—Possibly ; I do not agree that the failure was due to these two causes. I think the main cause of the failure was the appointment of what now at least turned out to be an incompetent gentleman for this post. That is my first complaint, that the gentleman who was responsible for the appointment is responsible for this failure.

Sir Frederick Hopkinson.—You are going on the assumption that it is a failure ?

A.—As the matter stands, I don't think there is any doubt, unless things take an entirely different turn in the future. At present there is not a single individual to say that it is not a failure.

Sir M. Visvesvaraya.—You say, " I will add a few more glaring instances which will satisfy the Committee that a deliberate and persistent method had been adopted not only to keep the public entirely in the dark but worse still, to mislead, by inaccurate and false statements ".

A.—I say so.

Q.—Is it not a strong statement ?

A.—Perfectly justified.

Q.—We have not got the facts before us. We are collecting them.

A.—I will produce my facts, I will particularly refer to one fact.

Q.—You refer to the dredger " Kalu " in the first place ?

A.—Yes. It was reported to be a good bargain. The actual expression used by Sir Lawless Hepper is that " the Government of Bombay did not at all make a bad bargain " in October 1924. It was made with a view to remove scare or panic.

Q.—It was purchased before the scheme was sanctioned ?

A.—That is admitted now. I may add one thing which is not in the statement I submitted. It is, that even the Government of Bombay through the Director of Information has made a statement with regard to the purchase of the " Kalu " and given a different date. They say in a letter that the dredger " Kalu " was bought by the Government of Bombay in direct communication with the Government of India, Marine Department, in February 1920. That is signed by Mr. Clee, Acting Director of Information. It is published in the *Bombay Chronicle* of 31st May 1924 in reply to a question raised by me.

Sir Frederick Hopkinson.—Just let me have that. What are you reading that from ?

A.—This is a letter published by Mr. Clee, Acting Director of Information, in reply to a correspondence sent by me. It was a very short letter : " With reference to Mr. Nariman's letter on the Development Directorate, which appeared in your issue of 27th instant, the following facts may be of interest to your readers.

" Sir Lawless Hepper relinquished the post of Controller of Munitions, Bombay Circle, in August 1918, and did not take up the appointment of Director of Development until November 1920.

" The dredger, ' Kalu ', was purchased by the Government of Bombay in direct communication with the Government of India, Marine Department, in February 1920." This was the query raised by me whether Sir Lawless Hepper, as the Controller of Munitions, Bombay Circle, had anything to do with the sale of the " Kalu " as it was sold by the Military Department. In reply to that, in order to show that Sir Lawless Hepper had nothing to do, they gave us various dates.

Q.—Are you making any suggestion of anything wrong in the sale or purchase of the " Kalu " ?

A.—I do.

Q.—What is it ?

A.—With regard to the sale of the " Kalu ", my contention is that according to information obtained, it was sold by the Port Trust to the Military Authorities.

Q.—That was long ago.

A.—The amount of the purchase is important.

Q.—We have got all that in your statement. I rather gather from it that you are suggesting something sinister in the actual dates about the sale and purchase of the " Kalu ".

A.—Considerable amount of surplus stores were lying unsold and the Government did not know what to do with them. It was dumped on to the Development Directorate simply to dispose of them.

Q.—Was anyone interested ?

A.—The Military Department was certainly interested in having the stores disposed of, and as there could not be any other buyer available, it was dumped on to the Directorate.

Q.—It was a public transaction between two public authorities ?

A.—Of course, it is.

Q.—And no one individual can be interested in it. What is it you suggest ?

A.—I suggest that the surplus stores of Government which were lying idle and could not be disposed of were dumped on to the Development Directorate and the public made to pay for it from public funds.

Q.—You suggest it was an improper price ?

A.—I say it was.

Q.—Who agreed to pay this price ?

A.—Apparently Sir George Lloyd's Government.

Q.—What you suggest is that the Government made a bad bargain ?

A.—Very bad bargain in order to relieve the military stores.

Q.—In order to relieve solely ?

A.—I won't say solely, but that was one of the considerations.

Q.—I know you make that statement. But it is only a statement.

A.—After all it cannot be anything more than that. What else do you expect ?

Q.—I suppose there was a willing seller and a willing buyer.

A.—Certainly, who would not be willing to get rid of.....

Q.—You suggest that the Bombay Government was not a willing buyer ?

A.—If the Bombay Government looked to the interests of the public and not the military stores, they should not have bought it. I don't say they were compelled against their will. This dredger, they knew or had ample means of knowing, was useless for the purpose of reclamation and therefore they should not have bought it without due enquiries for such a large sum.

Q.—You are putting yourself in the position of an expert.

A.—I gather from the evidence of experts and not from my own knowledge. I refer to the statement of Messrs. Jacobs and Davies. I have attached a copy of it which clearly shows that long before the Government bought this plant or dredger there was material which the Government could have consulted which would show that this was useless. If you will permit me to refer, Mr. Billimoria of Messrs. Tatas, while giving evidence before the Development Committee on 12th December 1913, stated that in the opinion of those experts (Jacobs and Davies) the life of the Dredgers was not very long and the Port Trust dredger was also coming to the end of its usefulness. Messrs. Jacobs and Davies are considered to be a reputed firm of Engineers.

Q.—When were they built, in 1914 ? This is 1920.

A.—My position is this that the Bombay Government were in a position to know the exact conditions of this dredger because in the record of the Development Committee of 1914, at page 321, Mr. Billimoria gives evidence. There he says they (Jacobs and Davies) said that the life of the dredger was not very long.

Q.—What was the date of this evidence ? The dredgers were new in 1914.

A.—They were bought in 1907 from Simons & Co. and they were used by the Port Trust for reclamation till they were sold in November 1915.

Q.—Eight years old. When the report was made they were only 6 years.

A.—According to the experts they were being used when it was said that they were coming to the end of their usefulness and Mr. Hewett was of opinion that the Port Trust dredger would not last long for the purpose of the reclamation. They should not be utilised for the proposed new reclamation scheme. That is the definite opinion of an expert, which was available for the Government before they went in for this dredger. One instance only will do to make the Government cautious.

Sir M. Visvesvaraya.—They transferred it from one Government department to another.

A.—That is admitted. If you will permit me to refer to Mr. Cowasji Jehangir's statement in the Council; he says that 9lakhs worth of stores were taken from the military including the

dredger. This was in reply to the question raised by me as to whether the Consulting Engineers earned a commission on that.

Q.—Are you sure about that ?

A.—Yes.

Q.—Have the Government acknowledged that anywhere ?

A.—I raised the question in the Council, to which the reply was given by Mr. Cowasji Jehangir that the total amount was 9 lakhs of which the price of the " Kalu " was part.

Sir Frederick Hopkinson.—I have got now to give you an expert's opinion. We have a dredger built in 1898 doing first class work,—pump dredger ?

A.—May be, there are dredgers and dredgers and experts and experts.

Q.—That is a fact for you ?

A.—May be. There are exceptions to every rule.

Sir M. Visvesvaraya.—As regards the " Kalu " you say that the Government of India transferred it to the Development Directorate ?

A.—That is so. Mr. Cowasji Jehangir was asked whether any stores from the Government surplus stores were purchased. He said that stores worth about 9 lakhs including the dredger " Kalu " were purchased and that the Consulting Engineers earned a commission on that although it was transferred from one department to another. I raised the question as to whether they were entitled to it.

Sir Frederick Hopkinson.—Mr. Nariman, perhaps I can help you about the value of these things. The " Kalu " built in 1907 pre-war was sold after the war. The prices of such dredgers were trebled and quadrupled in that period and therefore the price paid for the dredger in 1907 would not bear any reasonable comparison with its value in 1920 ?

A.—I quite agree with that. At the same time, I might say that when you are going to buy a plant which is to be used for a particular purpose, it is no use buying it if it is not useful and efficient for that purpose.

Q.—The prices were very high ?

A.—I know.

Sir M. Visvesvaraya.—But it was difficut in those days to get makers of machinery to supply plant at short notice.

A.—They should not have bought it at all, knowing the condition of it, the previous history. It is no use buying it as it would be useless. If the public funds were to be properly protected, some enquiries should have been made knowing that its previous history was next door to Government.

Sir Frederick Hopkinson.—Unless you give some evidence to the contrary the presumption is that the dredger, built in 1907, which was taken care of for some time ought to be a good dredger in 1920 ?

A.—My submission is that there was evidence to the contrary : the Port Trust has working experience and *prima facie* the statement of those experts, that should have at least warned the Government.

Q.—That statement is of no value ?

A.—To laymen it has a very great value. Besides that, there is the working experience of it with the Port Trust.

Q.—We had no complaints about its working ?

A.—The fact is there. Its output was much less.

Sir M. Visvesvaraya.—The output is usually less, though the dredgers work up to maximum output ?

A.—Is it suggested that the statement given by the manufacturers as regards the output is usually inaccurate. It does not come up to their statement.

Q.—If they work under ideal conditions.....

A.—That is a matter for experts.

Q.—Next you come to estimates ?

A.—Yes. Mr. Cowasji Jehangir never told us the original estimate. In reply to a specific question that I asked, he said that the sanctioned estimate was never 4 crores, that it was only the estimate made by Sir George Buchanan and that it was never accepted by the Government.

Q.—Was not the 4 crores announced at any time ?

A.—No, it was never known. When questioned there was a misleading statement about it. They only announced that the estimate was increased from 4 crores to 7 crores. We wanted to know how it took such a big jump without any sanction from the authorities.

Sir Frederick Hopkinson.—It has been never mentioned. How do you know it was a big jump ?

A.—We came to know that when a statement was made by the Governor before the Indian Merchants' Chamber wherein it was stated that the estimate was raised to 7 crores. It was made long after. That speech came into my possession and I asked a question whether that was so, but it was denied.

Mr. Billimoria.—That was in 1921. You are talking of this in 1923 ?

A.—The question in the Council was long after. That was after I went into the Council. My most serious complaint is regarding the statement in the *Ad Interim* Report. That is a very serious matter. The Advisory Committee had consented to make false statement in February 1925 when the bubble had absolutely burst, that the project was undoubtedly successful. As a matter of fact, in 1924, Sir Lawless Hepper paints a different picture.

Sir M. Visvesvaraya.—Probably he must have thought that if the dredgers had worked some time longer the operators would have improved.

A.—There is no question but it means that he knew in 1924 that on account of the different nature of the clay the disaster was certain. He says that in evidence, which I read in newspapers. In 1924 he knew it was a failure, still in November 1925 he gives a false impression.

Q.—He had hopes of improvement ?

A.—It is not that he said that in the future he expected. He might have thought of the future but that was not the case.

Q.—You consider that 7 crores was excessive ?

A.—From the original figures, certainly. They told us that the estimate was placed before the Government. I am doubtful if the Government would have so meekly sanctioned the scheme. They wanted to raise loans which would not have been raised. If money was not raised the scheme could not have come into effect, a very serious matter. The Advisory Committee has made a false statement in February 1925 when the bubble had absolutely burst. As a matter of fact, in 1924, Sir Lawless Hepper paints a different picture.

Q —Then you refer to the circumstances attending the appointment of Sir George Buchanan.

A.—I shall read an extract from the proceedings of the Council.

"After receipt of a telegram from the Secretary of State another telegram was sent by the Government on the 26th May 1919 :—'A reply to the Secretary of State's first telegram was postponed in view of impending discussion with Sir Claude Hill and his return to England. This Government were opposed to employment of Mr. Cameron and in view of difficulty of getting Palmer out before October decided to employ Sir George Buchanan, who is at present engaged upon the work, and will probably after concluding the preliminary investigation, proceed home and make further enquiries regarding the dredging plant and material'. "

That is the telegram of the Government of Bombay to the Secretary of State dated 26th May 1919, which we take as the date of the appointment by the Bombay Government. Then he was asked to make a report on the 30th May 1919 and the subjects he dealt with are stated in the Council proceedings for 17th March 1926.

Q.—You refer to incorrect statements of responsible public officers ?

A.—Yes. I have given an instance.

Q.— " The work has proceeded smoothly according to programme " ?

A.—That is what Sir Lawless Hepper says.

Q.— "And its stability has been tested by several monsoons. Whatever apprehensions, therefore, the public may have had on this score the Committee see no reason to suppose that the Project cannot be successfully completed." That was on 17th February 1925 ?

A.—Yes.

Q.—" In regard to the possibility of financial loss, the expenditure has up-to-date approximated closely with the forecast, the total including interest charged to 31st March 1924 being Rs. 412·39 lakhs, against the forecast figure of Rs. 421·16 lakhs ". It may be that he thought that the dredgers were being worked under improved conditions. That was probably his idea ?

A.—That should have been put in if it were so.

Q.—Upon that statement the members of the Sub-Committee recommended the completion of the scheme ?

A.—Some of them. Others were more cautious. The Committee proposed to appoint a Sub-Committee to examine the financial prospects of the scheme in detail who recommended that the scheme should be proceeded with.

Sir Frederick Hopkinson.—Have you given a copy of the statement to the press ?

A.—No.

Q.—I am wondering whether it would not save time if they could deal with it and pick up parts of it to publish.

A.—I understand it was given just now. I did not think it right to give it before I was examined.

Sir M. Visvesvaraya.—" In its inception the legitimate constitutional control of the Council was removed by what I consider to be a manœuvring in legislation. "

A.—I mean regarding the creation of a special department. That is the constitution we want and financially the control of the Council should be exercised over it.

Q.—A body was constituted by an Act ?

A.—Yes.

Q.—You come to the general conclusion that all this makes one suspicious about the intentions of the Government in launching this huge scheme in this extraordinary manner.

A.—Yes. I have referred to the opinion of Messrs. Jacob & Davies on the scheme who were absolutely against it.

Q.—That is the opinion of one firm on behalf of a private.....

A.—On Mr. Duggan's evidence, which I read in the newspapers, I understand that Mr. Kidd was very doubtful about it.

Q.—Doubtful about which ?

A.—About the success of the reclamation.

Q.—It is on Mr. Kidd's report that the work is being carried out.

A.—I understand from Mr. Duggan's evidence that Mr. Kidd at a certain stage expressed doubt.

Sir Frederick Hopkinson.—Then the newspaper report is wrong. The scheme submitted by Sir George Buchanan is Mr. Kidd's revised.

Sir M. Visvesvaraya.—In 1914 circumstances might have been unfavourable but in 1920 when the land values went up probably they considered that the scheme would prove profitable and so the consideration of the scheme was taken in hand ?

A.—Certainly consideration, but my complaint is that all the necessary precautions which are usually taken before undertaking such a huge project were not observed.

Q.—But at the boom time everybody lost his head and naturally Government might have thought that the scheme would prove profitable ?

A.—Government cannot be expected to lose their head and if they did certainly they are to be blamed by the public. I can understand the Government considering the scheme because it was a boom time but I cannot understand their neglecting precautionary measures which had nothing to do with boom time. It was an absolutely engineering matter.

Q.—You say that Government did not consult the Port Trust ?

A.—They did not consult the Port Trust nor anybody else.

Q.—Then you go on to refer to responsibility ?

A.—I mean the responsibility of the appointment of Sir George Buchanan.

Q.—Not for the responsibility for the conduct of the work ?

A.—I think the whole responsibility could be considered from the first responsibility. Who was responsible for the appointment of Sir George Buchanan and if that gentleman did not turn out to be up to the mark so far as this scheme is concerned, then the responsibility must rest on the gentleman who made that appointment ?

Sir Frederick Hopkinson.—Who was that gentleman you mean ?

A.—Sir George Lloyd.

Q.—Sir George Lloyd alone or his Government.

A.—It should be the Government but subsequent events show that he was certainly bossing the whole show, but I do not mean any insult.

Q.—Would you not like a Governor to be a boss ?

A.—Not from the democratic point of view.

Sir M. Visvesvaraya.—You say, " the first and foremost Government or individual who was responsible for the appointment of Sir George Buchanan on the post is primarily to blame ? "

A.—Yes.

Q.—You say " the circumstances under which this most important and lucrative appointment was made are extraordinary and certainly call for thorough and searching enquiry ". In what respect do you consider they are called for ?

A.—They did not invite any application for such an important post carrying a very great remuneration.

Q.—But you have to search a consulting engineer, ordinarily they do not offer themselves ?

A.—Unless they know that their services will be required how can they offer themselves. How should the best engineers know that such a huge project was in the mind of Sir George Lloyd and unless advertisement is given nobody is supposed to come forward. As I have

mentioned in my statement that for a post of a Principal of a school they advertised in English papers. There was a complaint about this that unless you cannot get such a man in this country you should get him out of India. Such posts were advertised but this post was offered without advertisement. If it was advertised you would have got the best man available and the whole scheme would not have been in this position.

Q.—You say the appointment was made in hot haste ?

A.—The appointment was made in anticipation of the sanction of the Secretary of State. There was no necessity of such extreme haste. It was after all a business agreement with a firm of engineers and the man who made that appointments is responsible for the disaster that followed because he made a mistake. In the case of such an appointment every care should have been taken before selecting a man. I do not wish to say against him particularly when he is absent, that his previous record does not show that he was qualified for this huge task of reclamation. He was only a Port Trust engineer and, according to my information, he was at Basra doing some dredging at Euraphatis on a much smaller scale but his efforts there also were not successful. " Kalu " was also there and he had seen the working of the " Kalu " at Basra.

Q.—Then you say " the fee paid was non-votable." What were the particulars of that translation ?

A.—All allowances under the Government of India Act are votable items, that is, they must be put to the vote of the Council before they are sanctioned or spent. Any expenditure on votable item without the vote of the Council is illegal expenditure. This allowance of Sir George Buchanan coming to about 1,60,000 a year, an annual expenditure, was treated as non-votable until 1924 till the Auditor General found out the mistake and refused to sanction on that particular date. Then the Government were obliged to bring it before the vote of the Council. My complaint is that by putting it as a non-votable item they evaded discussion because that was the only item on which the whole thing could be discussed. They did not disclose the agreement to the House. If this item had been treated votable, the public would have known the facts much earlier. It was disclosed at a very late stage by a mere accident.

Mr. Billimoria.—Even if a project was sanctioned for the full amount this should have come before the Council ?

A.—All large items of expenditure, if they are votable, must come before the Council and the non-votable items are included in the budget we are not entitled to discuss them. In the annual budget all items which are votable must be put up to the vote of the Council and every Member has a right to move for the reduction of any votable item.

Sir M. Visvesvaraya.—When once you are committed to a scheme and when a gentleman is allowed a fee or commission for certain work under that, you cannot change it ; you are legally bound to continue to pay ?

A.—But before the agreement is made, you must have consulted the Council, and therefore I say the agreement was not constitutionally valid.

Q.—The work was started in the pre-reform days ?

A.—It was started in 1920 while the reforms came in 1919 and this agreement was made after the reformed councils came into existence. That is our complaint that this should not have been done.

Q.—Then you go on to the purchase of dredgers. About " Kalu " we have already referred ; what do you wish to say about " Sir George Lloyd "?

A.—About " Sir George Lloyd " I may point out that at one stage the price was shown to be 117 lakhs and it was subsequently raised to 134 lakhs.

Q.—You mean the total estimate ?

A.—No, I mean the purchase price. A complaint was made about it in Council by Mr. Lalji Naranji.

Mr. Billimoria.—I suggest that it may be due to difference in exchange ?

A.—Such a large amount as 17 lakhs. I only want an explanation about two different figures being given.

Sir Frederick Hopkinson.—We cannot give you.

Mr. Nariman.—Then it was purchased many months before it was required and interest charges were paid from the public fund. No tenders were invited for such a costly and important plant.

Q.—How do you know that ?

A.—From the Council proceedings. When we asked for information about this, the Government had not even the contract which was made (by whom, I do not know) for the purchase of " Sir George Lloyd " and it was not shown to us.

Q.—It may have been in London ?

A.—The Government is supposed to have a copy.

Sir M. Visvesvaraya—No copy of the agreement was ever disclosed ?

A.—No, the Government said they are not in a position to do it.

Q.—Then your allegation is that Sir George Buchanan was paid commission on the " Kalu " also ?

A.—Yes, commission was paid on all stores locally bought from the Military surplus stores.

Mr. Billimoria.—If you refer to the agreement you will find that it is a matter of interpretation.

A.—It may be but it seems to me as a layman rather strange that when stores are transferred from one Department to another even then the engineers have earned a commission. So far as I understand, commission is paid because he has to labour to select the plant and take the responsibility but when stores are transferred locally, I do not think he has earned his commission.

Sir M. Visvesvaraya.—What do you wish us to examine on this point ? The Committee will be pleased to investigate if you made a definite statement.

A.—My point is that Sir Lawless Hepper as Controller of Munitions was in charge of this " Kalu " at any stage and as such must have known its condition. Then of course it was his duty to dispose it of. Admittedly " Kalu " was in the possession of the military for about four years from 1915 to 1919 and Sir Lawless Hepper was the Controller of Munitions, according to his own statement, till August 1918. For three years he was in charge of that store and he must have been aware of its condition but when he came here as Director of Development he bought it. So he was a seller as Controller of Munitions and buyer as Director of Development.

Sir Frederick Hopkinson.—Do you suggest it was a good or a bad bargain ?

A.—You know that from the results.

Q.—How do you know it was a bad bargain ?

A.—Stores worth 9 lakhs were purchased among which " Kalu " costing about 7 lakhs was included and from the working of Kalu I can say it was a bad bargain.

Q.—What about the other portion of the purchase ?

A.—It was a very small item of about 2 lakhs but the dredger costs 9 lakhs.

Sir M. Visvesvaraya.—Again under " technical aspects " you refer to insufficiency of preliminary investigations. I suppose you mean investigations about the material available ?

A.—Yes, that is my point. Compared with the precautions taken by the Port Trust on their smaller reclamation, sufficient investigation was not made and borings of 1912 were depended upon. No pucca borings were taken in order to ascertain the real natural of the sea bed and what kind of material was available for the dredger to work upon. As an engineer you can appreciate this point better than myself.

Q.—Again you refer to a compaign of misrepresentation and say that " the original estimate was first raised by 100 per cent. and again by 300 per cent. increasing proportionately the period of completion ".

A.—As the figures stand now it is certainly 300 per cent. because I understand the latest estimate is for 11 crores and the original estimate was for 3 crores.

Q.—I may tell you that the present estimate is about 10 crores without taking into account interest charges.

A.—Interest charges have to be paid ultimately and so it comes to 11 crores.

Q.—You refer to " criticism on internal administration or rather on maladministration and the internal working of the scheme ". I believe you mean the administration of the Department ?

A.—Yes.

Q.—Are your contentions confined to the Back Bay Scheme ?

A.—That would be covered by the three instances I have given. I have referred to a number of others but as they do not come within the scope of the Committee, they may be left out.

Sir Frederick Hopkinson.—You cannot escape from what you have put down ?

A.—I do not wish to escape.

Sir M. Visvesvaraya.—What are the three instances ?

A.—First is about favouring a contractor, Balkishan Seth, second is about mild steel bars when the indent was changed and the third about the cement contract.

Q.—About No. 1, do you wish to add anything to what you have already stated in your written statement ?

A.—I have nothing more to add to that statement and I have drawn my conclusions on that. The second is about the alteration in the indent which was also admitted in the Council.

Sir Frederick Hopkinson.—I have read your document and perhaps all it implies is that a mistake was made by somebody in ordering $\frac{5}{8}$ bars instead of $\frac{7}{8}$. What would you say ?

A.—I cannot take it as a mistake, I take it as unnecessary superfluous order which was not required.

Q.—What do you suggest it was ordered for ?

A.—They were ordered to be dumped in Matunga Store Depot. Five-eighths bars were required but 5 was changed into 7 by the Superintending Engineer and $\frac{7}{8}$ bars arrived which were not of course required and were dumped into the depot and a fresh indent was sent for $\frac{5}{8}$ bars.

Q.—But I suggest that a mistake was made ?

A.—I do not agree that a mistake was made. It was not made in the original preparation of the indent but in a properly prepared indent figures were altered subsequently.

Q.—But even that may be a mistake because it is not a difficult thing to write $\frac{7}{8}$ instead of $\frac{5}{8}$ and the Superintending Engineer had nothing to do with the indent ?

A.—The Executive Engineer prepared it and it was submitted to the Superintending Engineer who altered it ?

Q.—Again that might have been a mistake ? Do not you make mistake ? Have you never made a mistake ?

A.—Not of this description which is unaccountable which has cost so much, and I shall never make a mistake of this kind.

Q.—You do not say it was intentional ?

A.—I say it is intentional. From the circumstances I can say that it was not a mistake.

Q.—We wish to get at the bottom and would like to know why he should make such an intentional mistake ?

A.—These surplus stores were ordered in order that certain manufacturers might make some earning out of this order. As far as I can see, there is no other explanation, otherwise these stores would not have been ordered to be used as scrap iron. When I asked a question in Council they said there was no loss, those bars were either disposed of or used otherwise. In order to verify the statement I found a bogus purchaser who wrote a letter to the Matunga Depot Officer. The Executive Engineer in reply wrote on the 25th January 1925, " In reply to your letter of the 24th instant, I write to inform you that your representative can obtain information on any week days from my Assistant Engineer of Stores whose office is also at Matunga. The mild steel bars can also be inspected at Matunga ". He also received a list of mild steel bars available for sale to the value of $4\frac{1}{2}$ lakhs and amongst it were included these bars which were ordered by mistake and were supposed to have been used by the Department and no loss was caused.

Mr. Billimoria.—You have stated in your statement that some of the mild steel bars were indented for by the Executive Engineer, to which year do you refer ?

A.—This was in 1921.

Sir Frederick Hopkinson.—Perhaps this might be for housing contracts ?

A.—Well, Sir, it was meant for housing contracts or for the development directorate, but the instance is there.

Q.—You say that this was altered, by whom was it altered ? By the Superintending Engineer ?

A.—That's for the department to answer.

Sir M. Visvesvaraya.—Will you please give the date of that letter ?

A.—The letter is dated 26th January 1925.

Mr. Billimoria.—How do you know that he altered the indent ? It might be a slight error ?

A.—My charge in the council was that an indent prepared by an Executive Engineer to be forwarded to Manufacturers at home for a large quantity of mild steel bars for concrete piles for the reclamation work and the size mentioned in the original indent by the Executive Engineer was $\frac{5}{8}$ which was subsequently altered after the indent was prepared but before it was despatched by the Superintending Engineer into $\frac{7}{8}$. The quantity required was about 1,200 tons costing nearly three lakhs of rupees. The altered indent was sent to the home manufacturers by the Superintending Engineer and the bars arrived of the size and dimensions of $\frac{7}{8}$ which were totally useless for the work.

Q.—But there can't be any dishonest motive, it might be a slight error of judgment ?

A.—Whatever that might be, Sir, but it's for the Committee to decide whether this was a waste of the public's funds or not.

Q.—By whom was the indent altered ?

A.—The Superintending Engineer.

Sir Frederick Hopkinson.—Have you seen that altered indent ?

A.—How can we ? We were not shown that.

Mr. Billimoria.—Do you suggest any alterior motive ?

A.—Yes.

Q.—And you are not in a position to give the name of that gentleman ?

A—I have mentioned the name of the Superintending Engineer.

Q.—Was he alone or several others were associated with him, or any particular party ?

A.—Well that's very easy for the Committee to find out. If you will refer to the Development Department they will tell you.

Sir M. Visvesvaraya.—Can you give us any idea of the magnitude of loss caused by this transaction ?

A.—This one transaction alone caused according to the information given to us a loss of about 2 lakhs as the original indent was based for 2,50,000 which we came to know only in January 1925.

Q.—This is said to be due to a clerical error ?

A.—Whether it is due to error or at anybody's intention, but the public moneys were wasted and it's for you to decide.

Mr. Billimoria.—Perhaps they would not have required this afterwards ?

A.—Well, it's for them to explain.

Sir M. Visvesvaraya.—You say again on page 21 that tenders were not open to the public ?

A.—Well, at first no public tenders were invited but after about eighteen months public tenders were invited. Mr. Thomas who opened the tenders, was in charge and he asked all the contractors to clear out of his room when he opened the tenders. The merchants naturally protested and desired that the tenders should be opened in their presence but he paid no heed and allowed only one contractor to enter the room whenever he liked.

Mr. Billimoria.—Who was that man ?

A.—Well, I have already mentioned his name, his name is Mr. Balkishendas, a man from upcountry.

Q.—Is there any proof ?

A.—The fact is there and it is for you to find out. Of course you cannot expect where discrepancies of such kind turn up there can be regular accounts or passing or exchanging of cheques so that proper evidence might be recorded but as ordinary and reasonable persons would do taking all the circumstances into account you will find out that this man got contracts to the tune of about 9 lakhs.

Sir Frederick Hopkinson.—Was that the amount of profit he carried ?

A.—Not actually profit, because as far as information goes this gentleman was once given Rs. 10 or more per truck of nineteen or twenty tons for Colaba section filling in which was then reduced to Rs. 6 and then to Rs. 4-6-0. But after some objections that we took in the council it appears that circulars were issued in the department directing that public tenders should be invited for all this sort of work, as a result of which this gentleman reduced his rate to the last figure of Rs. 2-8-0 per truck making it at two annas per ton. Thus for exactly the same sort of work and the former work was easier as trucks were directly emptied near the rails whereas now it is a bit expensive as the materials had to be carried to a little distance from the rails, the same contractor who had offered and obtained the rate of Rs. 10 or more per truck was now prepared to work at the rate of Rs. 2-8-0 per truck.

Sir M. Visvesvaraya.—What have you to say in regard to the cement contract ?

A.—Well, Sir, I would not repeat that an agreement is made by the Development Directorate with four cement companies the names of which I have already stated in the statement, and these companies were given the monopoly of supplying all the cement required up to 60,000 tons per annum for ten years commencing from about September 1922 at a rate equivalent to ninety per cent. of the actual cost of cement in the financial year of the company concerned preceding the season in question plus 15 per cent. According to this term, cost to Government came about to from Rs. 60 to Rs. 70 per ton. Shortly after the agreement was executed, the price of cement began to fall considerably in 1923, it came to Rs. 40 per ton and in 1924, even from Rs. 40 to Rs. 30 per ton and the rates were particularly low for large quantities. At a difference of Rs. 30 per ton the total difference for 60,000 tons, the full requirement of the Directorate, would come to Rs. 18 lakhs a year and if the rates remain the same or go lower still in the course of 10 years, *i.e.*, the full period of the agreement, the total loss would be one crore and 80 lakhs. Besides this annas 14 per ton are spent for testing the cement supplied. Thus in one transaction alone the Directorate would sustain a heavy loss of 1½ crores and to that extent the Indian Cement Companies will be benefitted at the expense of the public. This agreement binding the Directorate for such a long period was made at a time when every shrewd man of business in this line knew that there was bound to be a slump in trade in this particular commodity and even from the year 1921 the slump had commenced in Europe and America and the prices were rapidly going down. About two years ago, one of the contracting companies expressed its inability to continue the terms of agreement and by an arrangement with the Directorate the benefits accruing to that company were transferred to another company for consideration. Thus the Directorate instead of availing itself of the opportunity of reducing the liability, again deliberately renewed the agreement with another company. Another way of saving loss to public fund was to allow the contractors to buy cement cheap from the market as there was nothing in the agreement to compel private contractors to buy the cement under that agreement, while it is reported that the Directorate compelled the contractors also to buy at these rates from the four Indian Companies alone.

Sir Frederick Hopkinson.—Were these local companies ? Do you mean to say that they should not make profits, won't you like to make profits ?

A.—Certainly they should make profits but I should not like it to profiteer and allow public funds to suffer.

Mr. Billimoria.—You mention, that certain consignments were ordered out in the personal name of Sir George Lloyd ?

A.—Yes, that's true. Several large consignments in the beginning, of machineries and plants intended for the Bombay Development Directorate used to arrive in

the personal name of Sir George Lloyd, the Governor personally and not in the name of the Development Directorate, which raised a strong suspicion among the public and several publicists wrote articles in the papers to that effect.

Q.—How do you know that certain goods were coming in the personal name of Sir George Lloyd, perhaps you are aware that there was a dredger called "Sir George Lloyd" and the consignments coming in India might be pertaining to the said dredger called "Sir George Lloyd" and this doubt of the public might have arisen owing to similarity of names ?

A.—Several publicists including Mr. B. F. Bharucha openly criticised the attitude of the Government.

Sir M. Visvesvaraya.—You refer on page 22 to Kandivli quarries and moorum supply ?

A.—Well, I do not attach much importance to this as it's one of the blunders of the department out of many more.

Q.—Then again you say that a large quantity of railway stock was ordered of entirely different standards from those required. That also refers to the housing department.

(*Sir Frederick Hopkinson.*—We have nothing to do with it.)

A.—That is only mentioned for your information so that you might ask the proper persons who have done this and that thing.

Q.—You say that in the establishment department out of 20 posts of high-salaried officials 19 posts were filled up by Europeans and only one by Indian ?

A.—Well, I objected to this high-salaried officials who had no knowledge of such work and who were carrying such high salaries which showed a clear waste of public money.

Sir Frederick Hopkinson.—Were you ever told of the qualifications of these officials ?

A.—Well, Sir, it won't perhaps be out of place to mention that the Development Directorate paid a high salary of Rs. 6,000 to the Director Sir Lawless Hepper, a salary next to the Governor in this province and who is also provided with a bungalow of the cost of about 3 lakhs. We repeatedly protested against this in the council and as a result only about two years ago his pay has been reduced to Rs. 4,000. How was he qualified to be the head of the largest work of the world ? Had any experience of the reclamation work ? A man who has simply worked as an agent to a particular railway or as Controller to a Munition Board ? From his evidence before you, Sirs, he has entirely disowned all engineering responsibilities hence his duties were only administrative, *i.e.*, similar to those discharged by the Chief Secretary to Public Works Department with some additional autocratic powers. My contention is that Secretary's salary does not exceed generally Rs. 2,000, then why was he favoured with such an extravagant salary of Rs. 6,000 with a commodious palatial bungalow worth about two or three lakhs.

Sir Frederick Hopkinson.—If they received salaries, do you object to it ? Don't you like to receiving one ?

A.—Of course if I deserved it, I would, why should I not, but God forbid I would not receive any salary as I have my profession. But apart from the above example, there are many I have stated in my statement. Many a men with meagre or no qualifications were provided with fat and high salaries either as deputy or assistant engineers. Perhaps your Committee, Sir, I submit, will be able to find out, with regard to most of the officials getting salaries of Rs. 2,000 and upwards as to what appointments they held prior to this and what were their salaries. This is not the only carelessness and waste of public money but as I have stated already several consignments were also coming in Sir George Lloyd's name.

Mr. Billimoria.—But Mr. Nariman, I have already made it clear that that name perhaps might have been put for the reason that these consignments must have been belonging to the said dredger "Sir George Lloyd" ?

A.—Well, to tell you, it seems to me a very ingenious explanation.

Sir Frederick Hopkinson.—We have gone through this item, and why should you waste time over discussion of this nature ?

A.—Well, if it's a waste of time for the Committee, and if a witness is insulted like this, I would clear out of the hall. It's your view and not the view of the Chairman and other members of the Committee. If they too say so, then I would leave at once and waste not a minute of mine here. It's very regrettable that you don't appreciate that I am on the contrary helping you.

(*Mr. Billimoria.*—Mr. Nariman, perhaps you have taken a wrong interpretation of Sir Frederick's view.)

Q.—Finally, you point out that the transactions were conducted in opposition to the rules prescribed ?

A.—That is what I say. That is also the strongest point. I have got all the rules and sections of the Government of India Act.

Q.—You have given us all the criticisms you have to offer. Can you tell us what you wish done in future if you had your own way? For instance, we had an Advisory Committee. Do you want a Committee or do you want the work to be carried out departmentally?

A.—I want first of all the Directorate to be abolished immediately, and their activities to be transferred to the Public Works Department and brought under the control of the Council, and it should be left to the Council to do what they think necessary. If they think there ought to be a Committee of citizens to watch this or an executive Committee to be associated with the Department, it is for them to decide. It is the function of the Council to decide as to how they should proceed further with the scheme.

Q.—It has been suggested that a board like the Port Trust or the Improvement Trust should be appointed. What opinion have you as to a separate board for this?

A.—I am not in favour of that. I do not think it is necessary. I am more in favour of its being transferred to the Council in its ordinary original activity, I mean to the Public Works Department. The Executive Committee members may be associated with the Public Works Department for this particular scheme. It will be a matter of arrangement between the Government and the members of the Council. Supposing the Council passes a resolution that there is to be an Executive Committee and that members of the Council as well as outside advisers should be associated with this particular committee, and they should be advised constantly by the Department, that can be done.

Q.—Such a Committee you want to control, and to sanction estimates?

A.—Sanction estimates, internal administration, retrenchment, contract, everything.

Q.—Do you wish the work to be carried out departmentally or by contract or by sections?

A.—I do not want the whole work to be completed at all. Certainly not. And as regards the work that is in hand, the military land as well as opposite Churchgate, that may be done either by the Public Works Department or by contract, whichever is the cheaper and efficient method.

Q.—You want to finish that and leave the other portions incomplete?

A.—It is impossible to leave them where they are. That must be finished as a matter of necessity. There is no choice in the matter.

Q.—In your statement you have made certain definite charges of corruption against certain individuals in connection with Back Bay. There are several of them.

A.—I adhere to every statement made in that statement.

Q.—When did you learn about that corruption?

A.—Some time in the beginning of say 1923 or 1924.

Q.—Were not you offered in July of last year a judicial inquiry into those cases?

A.—No. I was not offered the inquiry which I had been demanding.

Q.—Were you not offered judicial inquiry into cases of corruption?

A.—No, I will tell you what I was offered. The terms which were offered to me are not a judicial inquiry.

Q.—I am dealing with charges of corruption. You have gone further than you did last year. You have given no names.

A.—I have given instances in my Council debates. In March 1924, I have given instances. Names I have not mentioned to-day. I have said, "Superintending Engineer" and if I was allowed to be associated with the Department and get information officially, I would have given all particulars.

Q.—In the statement you have given names?

A.—About Mr. Thomas you are referring. That was a subsequent event.

Q.—About Mr. Balkishan the contractor. That is a definite case. You declined to have that inquiry last July?

A.—I did not decline. I wanted certain conditions.

Q.—As a good citizen of Bombay, don't you think it was your duty to do anything you could to prevent such things?

A.—Certainly, that was what I tried by having a resolution passed by the Council.

Q.—But you were offered a judicial inquiry?

A.—It was not a judicial inquiry.

Q.—An inquiry presided over by a Judge?

A.—With no opportunities given to me. I was asked to stand before it as an accused person, and I would be given only the documents which the Department thought it advisable to give me.

Q.—You did not mention any names last year. You were offered an inquiry presided over by a Judge in order that you may prove this case. Instead of that, you presumably allowed these things to go on?

A.—I was quite helpless.

Q.—You could have stopped it ?

A.—I could not have, when the Government would not have an enquiry by the Council members.

Q.—Don't you think a judge is better fitted ?

A.—May or may not be.

Q.—You had made direct charges of fraud, and the Government gave you an opportunity to have them proved.

A.—They did not.

Mr. Billimoria.—There are those letters to Mr. Nariman, letter dated 28th April 1925 and 13th May 1925.

A.—There are my replies if they are before the Committee. I have explained my position there. I adhere to the position to-day.

Q.—Your statement is full of innuendo. For instance, in the middle of page 17, you say, " It is now nearly two years since that resolution was passed when these allegations were made and most of the officers concerned have left the service."

A.—Yes.

Q.—And then at the top of page 17, " When allegations are openly made....". Allegations are easily made, are not they ? You had made general allegations and you were asked to convert those into specific allegations which you declined to do.

A.—No, I did not decline. I wanted the resolution of the Council to be respected. What was the objection in the Council members inquiring into the matter ?

Q.—Have you any other cases than have appeared in this statement ?

A.—About the corruption with regard to reclamation alone ? No. I must make my position clear, that I am placed at a great disadvantage on account of the limited reference to this Committee. I have got instances which are really fraudulent, if you will allow me to go into them.

Q.—But you see we cannot do.

A.—I quite realise that. Therefore, I have applied the terms should be extended and I hope the Government of India would have granted the resolution of the Corporation.

Q.—Then at page 32, three-quarter of the way down you say, " It could not be merely on account of friendship as no friendship could exist between an Indian convict and high European officials." You tell us who these European officials are.

A.—Those who had to deal with the contract to Balkishan Seth. How many officers had to do I cannot say. It is a departmental secret. I do not know who it was. I only say it could not be merely on account of friendship.

Q.—You suggest there must have been some other arrangement that the gentleman you have been speaking of as a fact has been corruptly giving commission to one of the Engineers ?

A.—That is my submission. I cannot find any other reason for this conduct.

Q.—If that is the case, it is a matter for a criminal court to investigate far better than we can do it.

A.—Decidedly.

Q.—I presume Government will take some steps.

A.—I hope so, although it is too late in the day. They ought to have taken it on my resolution in 1924.

Q.—You did not give names.

A.—I wanted a committee of investigation. Why should they have refused it if their hands were clear.

Sir M. Visvesvaraya.—You see, this Committee is now sitting for an enquiry.

A.—I beg your pardon. I am talking about the Government of Bombay. The Government of Bombay has consistently refused investigation in spite of the resolutions of the Council and it is over the head of the Government of Bombay that the Government of India has appointed this Committee. I am talking of the Government of Bombay and I say they did not allow an investigation.

Mr. Billimoria.—It was at the instance of the Government of Bomba that the Government of India have appointed the Committee.

A.—The Government has changed. I know the present Governor's attitude in the matter.

Sir F. Hopkinson.—When did the Government change ?

A.—December 1923. The new Governor took time to study the question, and I think his attitude is satisfactory so far as the public are concerned.

Mr. Billimoria.—At page 9 of your note you are speaking of the responsibility of appointment of Sir George Buchanan. You say Sir Lawless Hepper attempts to shift the

whole burden on Sir George Buchanan. I cannot clearly follow what your argument is ?

A.—At least so far as the public are concerned, so far as the reports in the newspapers go, Sir Lawless Hepper's whole trend of evidence seems to show that he wanted to disown all responsibility for this disaster. Sir George Buchanan writes in the papers trying to transfer it over the head of the local Government to the Directorate. If it had been a credit or success each party would have been equally anxious to take the credit.

Q.—What do you attribute the failure to ?

A.—I attribute the failure to absolute recklessness on the part of the Government from the very start, absolute negligence in a manner which is impossible to believe a responsible Government would have committed itself to.

Q.—It is a very strong statement.

A.—I adhere to it. I know what I am saying.

Q.—You suggest that the Development Department may be absolutely abolished. Do you suggest any other agency to undertake that work ?

A.—The Public Works Department. Not the whole scheme. Only the military land and that opposite Churchgate. It cannot be left in the stage in which it is. I am not in favour of spending any more money.

Q.—Having done that ?

A.—It is a matter for consideration. There is very little material to come to a decision on this subject and there is no necessity.

Q.—While you were talking about the " Kalu " you said it was dumped on this Government. Is it not natural that when this Department was created and when the work had been undertaken and when the department wanted some dredger it should be purchased. It may not be dumping.

A.—I call it dumping, because without knowing what material it was going to work, and without making any inquiry of the Port Trust or other authority it was purchased. If the cost of the dredgers was prohibitive, that is a consideration not to start the scheme. If the dredgers cost 2 or 3 crores certainly fresh consideration should have been given before starting the scheme.

Q.—Then you have made some statements regarding the appointment of Sir George Buchanan. But you perhaps seem to forget that the Secretary of State for India was approached by the Government of Bombay to recommend the name of a suitable Engineer.

A.—They did, but the Government of Bombay would not accept. That is what I read in the Council report of the 17th March. Because the Secretary of State did not or could not find another suitable man, Sir George Buchanan's services had to be engaged. Where was the hurry ? It appeared as if without Sir George Buchanan and the dredger, Bombay was to go to rack and ruin.

Q.—We come to the question whether there was or was not immediate necessity.

A.—There was no necessity.

Q.—None of the honourable Members of Council at the time the scheme was launched raised any question. On the contrary as the papers before us go, it is stated here distinctly that everybody applauded it. I will read the exact wording. " None of the members of Council criticised the scheme at that time. But on the contrary they commended the scheme and congratulated the Government on the boldness and courage shown in the undertaking of the scheme. .....The scheme was said to be a very sound one, and expected to yield a huge profit."

A.—Because of the statements of the Government Officers, and I must say if I had been a member probably I might not have swallowed all the Government did say. But it is rather a misfortune that the members did swallow and so we are in this position. They should have judged for themselves without regard to the statements of Government.

Sir M. Visvesvaraya.—But the atmosphere was different.

A.—I could understand the atmosphere when dealing with private funds of their own. They should be cautious when dealing with public funds.

Q.—Have you any other substantial instances of corruption ?

A.—I have numerous, but not with regard to the reclamation.—But unfortunately I have not been allowed to mention those.

(*Mr. Billimoria.*—Whatever instances you have quoted will be brought to the attention of Government.)

Sir F. Hopkinson.—With regard to your remarks about the " Kalu " you would be interested to hear that in March 1916 the " Kalu " was surveyed by the Chief Constructor and the Inspector of Machinery of the Royal Indian Marine Dockyard, Bombay, and the Surveyor to Lloyd's Register and certified by them to be in good working order.

34th Witness

Mr. Lalji Naranji, M.L.C.

Mr. Lalji Naranji, M.L.C., representing the Indian Merchants' Chamber was examined.

Written statement put in by the Indian Merchants' Chamber (Mr. Lalji Naranji, M.L.C.)

The various proposals for the Reclamation of the Back Bay and how it was turned down time after time by the Government of India and the Secretary of State is given in the dissenting minute of Mr. Manu Subedar, the Chamber's representative on the Advisory Committee in their second *ad interim* report on the subject. It is there also shown how Government finally launched into this huge gamble and deluded themselves and the public with prospects of huge profits of 300 and 500 million rupees that were to be available for the benefit of the labouring classes and the poor. It is therefore not considered necessary to repeat it all here, and only matters arising after the launching of the scheme and which have formed the subject matter of correspondence between this Chamber and the Government will be noted in the present memorandum.

Early in 1920 the Government came forward with proposals for development of Bombay and floated a big loan which they emphasised was to be spent

"in Bombay, by Bombay and for Bombay."

Our Committee addressed Government on the 8th November 1920. In this they urged Government to carry out the promise implied in the above slogan to give preference to Indian contractors and pointed out that such men would prove successful in dealing with difficult problems of labour and local conditions than non-Indian contractors could be. They said further that they understood Government's intention to be to give such contracts on basis of costs plus profits and very strongly urged that this should not be done and that

> "an attempt should be first made to secure firm bids which they felt would be forthcoming at least from Indian contractors."

They further pointed out to Government that

> "from the point of view of a public body it was extremely undesirable to render itself liable to large excesses on their estimate owing to the uncertainty of cost plus percentage basis and that even if it cost more public bodies should insist on limited liability, *i.e.*, fixed prices, and not depend on a contractor's figures of expenditure."

They consequently recommended the calling for tenders at fixed rates.

In a subsequent letter (11th February 1921) my committee pointed out that they understood in specifications for the Development Department only British Empire products were required to be used in all contracts. They drew the attention of Government to the fact that Belgian steel was quoted at only £15 to £16 as against £22 to £24 for British and urged that

> "Indian revenues or capital should not be thus penalised (by exclusive use of British goods) that definite instructions should be issued that where Indian-made goods were not available and the necessary materials have to be imported those should be imported from the cheapest markets."

The Government in their reply (16th February 1921) agreed to delete this stipulation from future contracts. My Committee were, however, surprised to learn from the same letter that

> "Government approved on 14th February the Director of Development's proposal that none of the tenders should be accepted and that work should be carried out departmentally",

thus definitely ignoring the warning conveyed in my Committee's letter of 8th November 1920. This, in the opinion of my Committee, was a most fundamental error and must have led to a large waste of public funds.

In a letter dated 8th April 1921, Government asked the Chamber for suggestions as to what public buildings ought to be included in the general layout of the Reclamation. My Committee at once pointed out in their letter of 10th June 1921, that:

> "they had great doubts as to the utility of reclaiming land from sea and consider that this scheme should not have priority to the other schemes before the Department, and this scheme of reclamation threatened to be of a stupendous character and suggested that the Development Department may well consider if it was worth going in for it when land of an immense area was lying waste and undeveloped."

Your Committee will better appreciate the position if we point out that at that date the removal of the Cotton Green to Sewri had already been decided on and the whole of the immense area at Colaba occupied in the storage of cotton was to become vacant and the further immense

area then occupied by the B. B. &. C. I. Railway Goods Yard at Colaba was also to be vacated and the removal of the line from Colaba to Churchgate was being very seriously considered. Therefore, apart altogether from any land in the Suburbs, a very large area of land at the very door of the business quarter in the Fort was to be very shortly made available, and there was no urgency whatsoever for prosecuting this disastrous scheme at all costs. They also began to feel that the arrangements for the control of these large schemes were entirely unsatisfactory and in a letter dated 14th June 1921 told Government that a mere advisory body without controlling powers would be useless and urged that a controlling body should be created and that the Development Department should be a *Transferred* subject in charge of a Minister instead of being treated as a Reserved subject as Government proposed to do. In their reply of 4th July 1921 Government turned down both the above suggestions.

This anxiety on the part of Government to keep the expenditure of these large schemes out of the purview or control of an authority amenable to public opinion created great uneasiness in the public mind and a requisition was received by the Chamber asking for a public meeting.

Before taking action on this requisition the Chamber thought it advisable to call for information as to the financial aspects of the Reclamation. In their reply dated 18th July 1921, Government said that from details of figures recently prepared they were satisfied that:

(*a*) the developed land would be ready to be placed on the market by June 1929;

(*b*) the total outlay including interest throughout at 7 per cent. would not exceed Rs. 850 lakhs at the most;

(*c*) the cost per square yard would be less than Rs. 15-8-0;

(*d*) Block 8 would be handed over to the military department at Rs. 20 per yard undeveloped and payment received by January 1927;

(*e*) total reclamation area will be 1,125 acres of which roughly 239 will go for roads, etc., 250 will go to the military department, leaving roughly 641 acres for sale of which cost in June 1929 will be Rs. 19;

(*f*) if 187 further acres are left out for open spaces cost will be Rs. 28; and

(*g*) Government do not anticipate having to borrow more than Rs. 4 crores from the public including the 2 crores already borrowed for the purpose in 1920.

It was further added that it was beyond the powers of this Government to make this Department a Transferred subject even if it was considered desirable to do so.

My Committee were told that His Excellency the Governor and the Member in Charge would be glad to receive them if they wanted more information.

This interview came about on the 9th August 1921, when His Excellency made a long speech explaining practically laughing out the fears of the Chamber and the public as to the difficulties of the Back Bay Reclamation Scheme from either the technical or the financial points of view. Among other things His Excellency said:

(1) that he might say without fear that this was the simplest reclamation from an engineering point of view of all the reclamations undertaken in and around Bombay;

(2) that they had consulted the best experts they could get hold of;

(3) that there was no conflict of opinion in regard to Back Bay and indeed there had been the opposite, *i.e.*, a concensus of opinion and it was rare indeed for experts to agree; and

(4) that he ventured to say that the Back Bay Scheme was a far safer piece of business than many of the solid businesses that were undertaken in Bombay City.

The whole speech is full of a tone of over-weening confidence which reads strangely in view of the fact as we know them to-day. There, however, seems to have been a glimmering already of the problematical character of the profits to be realised because while Sir Chimanlal Setalvad, the Member in Charge, spoke in February 1921 with great confidence of profits of 30 to 40 crores of rupees that would be available to Government for the benefit of the working classes. His Excellency in August 1921 in the course of this speech spoke only of successful fruition of the enterprise

"without loss and probably with a very considerable margin of profits."

In reply to the grievance expressed by the Chamber on behalf of the public that Indian were not being employed in adequate numbers His Excellency said that

"their first duty was to employ the best talent so that there should be the fewest possible mistakes."

The event has unfortunately shown what Himalayan mistakes this talented staff was capable of.

In a letter dated the 18th August 1921 Government also gave details of the costs under various major heads which may prove of interest to the Back Bay Enquiry Committee. As already remarked the Government wanted to run the whole show according to its own sweet

will and had already rejected the suggestion for the creation of a statutory body to control these activities or to give the Advisory Committee any powers. His Excellency had, however, given the assurance at the interview above mentioned that my Committee " would find Sir Lawless Hepper grateful for their advice and assistance and he would be willing to give to bodies like this Chamber the fullest possible information and withhold nothing of the main issues of the question." However, when Mr. Lalji Naranji, the Chamber's representative on the Advisory Committee called for information on certain points, it was refused on the ground that " such questions could not be said to be relating to the general development of Bombay and so could not be included in the Agenda of the Advisory Committee." My Committee drew the attention of Sir Chimanlal Setalvad, the Member in Charge, to this breach of the assurance given by His Excellency and added that if this was the treatment to be accorded to the members of the Advisory Committee, no useful purpose would be served by its representative remaining on it. This was on 6th February 1923, and in spite of several reminders, no reply was received till 21st June 1923 in which Government claimed that the questions covered the internal working of the Directorate and its purely executive administration and so did not come within the scope of the Advisory Committee. My Committee replied on 10th July 1923 insisting that " in their opinion the questions were legitimate and within the defined functions of the Advisory Committee ", and added, " if the machinery of the Advisory Committee was not to be used for eliciting information without which it was not possible for a businessman to take a whole and connected view of the situation and without it the Committee strongly felt that the Advisory Committee became valueless ".

The questions referred to above were calculated to bring out certain serious irregularities in the working of the Department as will be seen from the following :—

(1) How much money has been spent on experimental work on Worli Chawl constructions ?

(2) Whether the Superintending Engineer has had really any training and experience to undertake work of such magnitude before he was given charge of the scheme ?

(3) Was it at all necessary to appoint Superintending Engineer, No. 4 Project Division, when the work of the division could have been managed by any other man drawn from the other division.

(4) Was it not possible to save a sum of about Rs. 80,000 on 16 floor centerings for the chawls at Worli Estate if the work had been given on contract at a rate which would have included the rate for centerings ; whether any efforts have been made in this direction now ?

(5) Is it a fact that Superintending Engineer, No. 1 Project Division, is generally in the habit of using intemperate language towards the staff and others on the works and whether he used abusive language towards Mr. Odey Singh, one of the contractors, and his contract was cancelled and subsequently placed with Major Gammon & Co.?

(6) Is it true that Superintending Engineer, No. 1 Project Division, permitted Major Gammon & Company to make their own designs and increased the tender rates when the tenders had been called for and accepted on the old designs and at much lower rates and whether any test was applied to the old designs before they were rejected in favour of Major Gammon & Co.'s designs, while some of the Chawls were being built on the old designs. What has been the loss to the Government owing to this ?

(7) Is it a fact that Superintending Engineer, Nos. 1 and 2 Project Divisions, are given accommodation on nominal rents whereas the Executive Engineers and low salaried officers and other assistants have to arrange their own accommodation at high rentals and what action is proposed to be taken by the Director on their behalf ?

(8) Is it a fact that Superintending Engineer, No. 1 Project Division, has permitted contracts to be given to one of his Executive Engineers in his division ? If so, is this procedure in accordance with Public Works Department Rules ?

(9) What stores have been purchased through the India Office and what stores are purchased direct by the Development Department ?

(10) Why recently no such information is being placed before the Committee ? Are no purchases made from abroad ?

For the more recent stages of the controversy between the Chamber on behalf of the public and the Government we would refer to the Interim Report of the Advisory Committee issued in 1925 and in pursuance of which it was decided to stop work on the East Colaba Reclamation. Mr. Manu Subedar, the representative of this Chamber, was largely instrumental in bringing the Advisory Committee to see that this was the wisest course.

A Sub-Committee of the Advisory Committee was then appointed to go into the financial aspects of the Back Bay Scheme. It was composed of Sir Lawless Hepper, Messrs. Delves, Aiyar and Manu Subedar, the last being the representative of this Chamber. The three official

members tried to put the best face possible on the state of things, but were compelled to admit that :

> " the financial result, if the assumed conditions as regards disposal could be realised, would be to reduce the debt at *present values* to Rs. 336 or 337 lakhs. * * * * Even if the period of disposal is extended to 35 years the resulting debt at *present values* would be Rs. 455 lakhs which would still be substantially below the Rs. 488 lakhs that would be lost if the works were closed down now ".

They therefore recommended that

> " work on the sea-wall should be stopped for the present, and all efforts concentrated on the blocks 1, 2 and 8 ".

The absurdity of the above calculations will be seen from the following :—

> " (*a*) They base their calculations on land being taken up to the extent of 60 to 80 thousand square yards a year in lots of 12,000 yards on which blocks of six flats could be built and an yield on capital at 6 per cent. obtained by renting such flats at Rs. 450 a month."

Taking only a sale of 60,000 yards, it means 50 blocks or 300 new flats to be let out every year at Rs. 450 per month each. That gentlemen conversant with conditions in this City should assume that there would be 300 additional tenants year by year capable of paying Rs. 450 a month passes the comprehension of my Committee as they consider it palpably absurd.

(*b*) These gentlemen talk of *present values* of the loss.

This is an ingenious attempt to tell the public that the loss is after all only of a few crores, but the argument is most misleading. The following examples will make this clear :—

> If there was a debt of 100 crores payable at the end of 60 years and no interest is payable on it year by year and money could be invested at 6 per cent., then paying only Rs. 3·03 crores—its present value—will wipe off this debt. If, however, the debt is 100 crores and interest has to be paid on it, then the liability remains full 100 crores unless the debtor can find sufficient money not only for interest but something also against the principal. The absurdity of this talk about present values could be better appreciated by the lay mind if we mention the familiar instance of only one penny being laid out at 3 per cent. compound interest in the first year of the Christian Era. The total is so enormous that the present war debt of Great Britain is a mere bagatelle to it, but it is no satisfaction to the British tax-payer to tell him that he need not worry and that he has only to figure to himself that the British Treasury only lost a penny nineteen hundred years ago. We need not go 1,900 years back. A debt of 1,000 crores to-day would have a present value of less than Rs. 1,00,000 in the year 1726 on 6 per cent. basis, but to say that the public debt of India is insignificant because two hundred years ago it would have had a present value of only a lakh of rupees would be absurd.

Our representative, Mr. Manu Subedar, has taken the correct line and shown firstly that there was no warrant whatsoever for assuming that 300 additional new flats could be let in Bombay year by year at Rs. 450 a month and that apart from the period assumed the actual total loss to the Presidency will run into an enormous sum.

It was this exposure of the whole affair, largely due to the efforts of the representative of this Chamber, that has compelled the local Government to see the error of its ways, but work is still being carried on in spite of public opinion and it will be up to the present Enquiry Committee to recommend that the work be shut down altogether and an end put to further losses.

My Committee submit that the disastrous situation in which this Presidency now finds itself is very largely, if not solely, due to the vaulting ambition of Sir George Lloyd, the then Governor of Bombay, who thereby wanted to leave a monument of his regime in Bombay. In spite of the fact that exactly similar activities of the Port Trust, the Improvement Trust and the Municipality were controlled by Statutory bodies created for the purpose, the Development Department was made a Reserved subject solely to avoid any interference with his plans and kept what was going on from the searchlight of public criticism, and requests to create a controlling body and to make this a Transferred subject in order to bring it in the purview of the Legislative Council were repeatedly turned down. Even criticism in the Advisory Committee was resented and information which could have exposed irregularities was withheld.

We have quoted earlier the assurance of His Excellency that Government considered it their duty to secure the best talent. Your Committee may very well inquire what attempts, if any, were made to find out the most competent Engineers when Sir George Buchanan was appointed and who else were in the running and whether they were found inferior or whether it was a job given by Sir George Lloyd to a personal friend.

My Committee are emphatically of opinion that if a controlling body had been created containing representatives of various bodies, their business knowledge and experience would have made them pause as soon as the 367 lakhs of Sir George Buchanan had to be raised to 702 lakhs. They would have considered it essential for the sake of their own business reputation

to once more go into the financial aspects of the project and we have not the least doubt that they would have then come to the same conclusion as the Advisory Committee's sub-committee came to in 1925 that the sale of land was very problematical and they would have stopped the work before it was too late. The Government of Bombay did nothing of the sort because they had already hopelessly committed themselves to the scheme and incurred heavy expenditure on dredgers, etc., months before the sanction even of the Legislative Council. The position taken by them was even more reprehensible in that they had secured the sanction of the Government of India on the basis of the first estimate of Sir George Buchanan of only 367 lakhs and yet did not go up again to the Government of India when it was found that the figure was wrong by as much as one hundred per cent. Evidently the local Government was afraid that the Government of India might require the abandonment of this pet scheme of theirs. How far there was here a breach of constitutional practice we must leave it to your Committee to determine.

Not only was the public deluded with the glitter of fabulous profits to be made, but the correctness of their revised (and re-revised) estimates was emphatically asserted by responsible members of the Government. Thus as recently as 10th March 1924 the Honourable Mr. Cowasji Jehangir said emphatically that

> " the land when it was first ready for sale would cost Government Rs. 28 a square yard was a statement he repeated on that day and that he hoped he or his successor could repeat with confidence when the Reclamation was completed. "

The Report of even the majority of the Advisory Committee's sub-committee is a sad commentary on this ! !

Misrepresentation was kept up to the last because it was in February 1925 that Mr. Baptista on the eve of the first Interim Report, was assured that all was well in these terms :

> " In regard to the possibility of financial loss the expenditure has up to date approximated closely with the forecast ".

without any hint of the important fact that the work completed for this amount of money was far below anticipations.

It was by such continual misrepresentation of the true state of affairs that work was kept up on the Back Bay Reclamation all these years and it might still have gone on for years to come involving this Presidency in further heavy liabilities but for the exposure the representative of this Chamber forced on them. It is for your Committee to consider what recommendations they should make to the Government of India to prevent a repetition of similar happenings in future.

My Committee also strongly feel that the Government of India cannot righly absolve themselves of all responsibility in this sad imbroglio. If they had not lightly permitted or overlooked the breach of constitutional safeguards and if they had insisted on the matter being submitted to them when the original estimate was found 100 per cent. too low, the scheme could have been thrown overboard at a very early stage and the loss to the taxpayer of this Presidency would have stopped at a far smaller sum that they are now faced with, and my Committee consider that the least that the Government of India can do is to advance the sum now estimated to be definitely lost as a loan to this Presidency without interest and repayable in, say, 60 years.

Written Statement of Mr. Lalji Naranji, M.L.C.

The Development department owes its birth to the following amongst many reasons :—

1. Owing to the relaxations of the restrictions previously imposed upon the utilization of borrowed funds on capital expenditure with reforms under Government of India Act, 1919.
2. Owing to the removal of the essential condition of the employment of the loan funds on the construction of any works of its being direct revenue producing character.
3. Owing to the unhappy coincidence of a combination of both the then Governor of Bombay and the Finance Member of this Presidency being very ambitious, optimistic, speculative, irresponsible and of the belief that no rules laid down any obligations on them and forgetful of the fact that under the reforms they had certain obligations to meet.
4. Owing to the false demand of land temporarily created during the war and as an aftermath of the war.

It is a great error to believe that there is any want at present of land in the city of Bombay. The Back Bay scheme was undertaken on the assumption that the area of the business quarters was not sufficient. I can conclusively prove that it was entirely a false belief. If it is argued that Bombay will develop further, without being charged of being pessimistic, if one looks

ahead, he will find that there are no chances of developing Bombay any further. There are three things on which the further development of Bombay will depend :—

1. More Trade,
2. More Industries,
3. Further expansion of Bombay Port.

I do not expect further development of trade for the following reasons :—

Bombay in past had a monopoly of possessing a nice harbour well protected and well developed. Secondly, big boats visited as far as possible only the port of Bombay. In future, that monopoly will be broken in view of the development of Vizigapattam, port of Cochin, Karachi which are already in hand. The western coast of the Kathiawar States are not slow in developing their ports and the beginning of the activities of developing their ports are also seen which should not be ignored when the further Development of Bombay is considered.

Mill Industry.—The only industry worth considering in Bombay is the textile industry and the condition of the textile industry can be judged from the statement submitted by the Millowners' Association to the Tariff Board. Cheap freights from foreign countries to the ports of Bombay, Calcutta, Madras, Karachi, Rangoon, etc., are competing with the heavy internal freights of the Railways of India. It is due to this reason that many textile mills are now being built in the upcountry centres and even in the Indian States where one can save several forms of taxations and protection within the State by imposition of Import and Export duties.

The idea of further expansion of the Bombay port was conceived at a cost of about twenty to thirty crores during the regime of the same Governor and the Finance Member of this Presidency, but fortunately the port being under the guidance of business men has escaped any expenditure excepting the preliminary nature of examination. I should only refer to the members of the Enquiry the Port Trust Administration and also request them to examine the financial position of the Port Trust which will reveal the true possibility of the future expansion.

I should refer members of the Committee to the Census of India 1921, Volume 1921, No. II, Tables to the portion where there is the area, houses, etc., of the City of Bombay is given from which it will be seen that by the agencies of the Improvement Trust, Municipalities, and by the development of suburbs and by cheap and quick suburban service, the problem of the housing of middle and lower classes will be satisfactorily solved.

Thus it will be seen that no further big demand either for business quarters or housing is likely.

Until, therefore, the circumstances are changed radically it will not be wise to incur expenditure on false anticipations.

The failure of the Development Department and particularly the Back Bay Reclamation Scheme is due to the following amongst many reasons :—

1. The Honourable Sir H. Lawrence, the Finance Member of the Government of Bombay, has failed to execute his duties as a watch-dog of the Finances of the Bombay Presidency.

2. Instead of watching from the broad financial interests of this Presidency, this development and other such big capital schemes were undertaken by him without having paid any regard to the capacity of the finances of this Presidency which is to-day placed, in the words of the Auditor General as expressed in his letter No. 562 Admn./K. W.-48-26, dated the 7th June 1926, addressed to the Secretary to the Government of Bombay, Finance Department, in the following situation :—

> "The financial position in the near future will be serious. It is doubtful whether even the remission of the contribution to the Central Government will be sufficient of itself to ease the situation."

3. The Honourable Sir H. Lawrence instead of exposing to the Public the defects of the administration of the Development department, tried to minimise the Accountant General's strictures passed so early as 1920-21 and repeated in the next year 1921-22 about the working of the scheme of the Back Bay. Instead of taking the Accountant General's strictures in the proper light and protecting the financial interests of this presidency by thoroughly examining and taking actions on the strictures, he has disregarded the recommendations of the Public Accounts Committee made so early as 1921-22 of the necessity of the close financial control to be exercised by the Finance Department over the Development Expenditure.

4. The Finance Department under the Honourable Sir H. Lawrence has completely disregarded the repeated notices given by the members of the Council as well as by the Public Accounts Committee.

5. The Finance department should not have allowed the Development de artment to incur the expenditure according to the rules required by the Public Works Department Code

without insisting for the estimates being prepared. It appears that the expenditure to the extent of Rs. 1,90,64,766 was incurred without the sanction of the estimates as required by the Public Works Department Code. He could have stopped all this by insisting for a regular project estimate in the absence of which no effective financial control was possible. Regarding the huge Back Bay Reclamation scheme which had been in progress for 18 months, regular project estimates were begun to be made only after the progress of the work for 18 months. In the matter of detail working estimate for the Back Bay to start works, same want of sanction of the estimates was allowed to go on. I therefore hold the Finance department seriously responsible for all the losses that we have seen to-day.

6. The Finance Department, if proper enquiry is made, will be found to have allowed the expenditure to be incurred by a mere order of the then Governor of Bombay. They have failed in their duty for insisting on a right observance of the Government rules that were in existence. Finance department also has allowed the Development Department to keep big balances and thus cause a great loss by way of interest.

7. No attention was paid to the warnings of the mercantile bodies like our Chamber.

8. The demand of constitutional control being given over the affairs of the working of Development Department like the one enjoyed by Improvement Trust, Port Trust, and such other bodies was also disregarded.

9. The Advisory Committee was never given an opportunity of considering any serious matter about the working of this department.

10. The temporary speculative demand of the land was never fully gone into by those concerned.

11. The heads of the department fell victim to the unreal and speculative temporary demand for more accommodation for business as well as housing. The private adventures for want of other finance were prevented from continuing further losses but as this department and particularly the Back Bay scheme which was continued by unlimited finances at the cost of tax-payers of this presidency and particularly of this city and a free and full use of the finances brought the present condition.

12. The department was carried on without being responsible to the public or the Government. The policy adopted by the Government was not to give any information to the public as the Government of the Country should regarding the procedure and the conduct of this department.

How to get best out of the worst Job

Block No. 8 be completed at an early date as we have got definite buyer for that block, *viz.*: the Military Department of the Government of India and as according to the reports supplied by the Department, considerable portion has been completed and at the further new cost of about Rs. 14 lacs it can be prepared as required by the Government of India which will bring to us 239 lacs for Block No. 8 within two years or earlier. Government of India be approached to at least forego interest on the advances made by Government of India to the Government of Bombay for the Back Bay Reclamation purposes.

Regarding Block No. 1, in spite of the public demand to stop the work as Block No. 1 was proceeded with and as it is said by the Department and confirmed by Nelson Committee that we can prepare the land of about $4\frac{1}{4}$ lacs of square yards at a further new cost of 19 lacs of Rupees, I am in favour of completing the said block to get best of what has already been spent.

No further blocks be attempted until the mill industry prospers and the demand of the land is felt. If at any time such work becomes a necessity, it should not be done departmentally but by inviting tenders from contractors.

The Dredger " Sir George Lloyd " has no more work and should be immediately disposed of and the whole of the Development Department should be abolished at an early date and activities of this department be transferred to the Public Works Department as soon as it is practicable.

The whole scheme be taken as financially unsound and the amortization of debts by providing for sinking fund every year be provided by further retrenchment from the cost of the general administration of the Presidency.

The Chairman.—Mr. Lalji Naranji, you are a member of the Legislative Council ?
A.—Yes.

Q.—And President of the Indian Merchants' Chamber and Bureau ?
A.—Yes.

Q.—A merchant prince of Bombay ?
A.—I am a merchant in a small way, Sir.

Q.—You have given us three statements, one by yourself, one on behalf of your committee by Mr. J. K. Mehta and a third entitled " How to get best out of the worst job " by yourself. On which of them do you like to be examined ?

A.—All three of them. The statement prepared by the committee is a general statement, that by me personally is the result of my experience as a Member of Council and as a member of the Public Accounts Committee and the last statement I prepared after I signed the Kay Committee's report which is still confidential.

Q.—You are a member of the Kay Committee ? It has finished its report ?

A.—Yes.

Q.—You begin your statement by saying that " the Development Department owes its birth to the following amongst many reasons ". You have given four reasons and the first is—" Owing to the relaxations of the restrictions previously imposed upon the utilization of borrowed funds on capital expenditure with reforms under Government of India Act, 1919 ". Under the reforms there was a relaxation of the previous restrictions, because the reforms were introduced just at that time ?

A.—Yes. These are not the words exactly of the Accountant General. As I have said, they have been confirmed by the Accountant General. The first Appropriation Report for the year 1921-22 that was submitted to the Council says so and these are all quotations from that. Every word of it is confirmed by the Accountant General.

Q.—" Owing to the removal of the essential condition of the employment of the loan funds of the construction of any works of its being direct revenue producing character "—what is meant by that ?

A.—Before the reforms no local Government could take up any enterprise by borrowed funds without its character being revenue producing. I should in this connection like to refer to page 15 of the Appropriation Report of the Accounts of the Bombay Presidency for the year 1921-22. It is said very clearly here that " under the reforms the restrictions previously imposed upon the utilization of borrowed funds on capital expenditure have been very materially relaxed. Under the Local Government Borrowing Rules a local Government may now raise loans on the security of its revenues for certain purposes specified therein. Amongst those purposes is one of wide importance, namely to meet capital expenditure on the construction or acquisition of any work of a permanent or of a material character in connection with a project of lasting public utility, provided that the proposed expenditure is not so large that it cannot reasonably be met from current revenues.

" (2) If a project appears unlikely to be of lasting public utility and not capable of giving a sufficient return it should not be embarked upon".

Paragraph 28 on the same page says " It will be seen from the above that the productivity of a work, that is its direct revenue producing character is no longer, as in the past, the essential condition for the employment of loan funds on its construction ".

Q.—So Government may start any large work of this character without reference to the Government of India ?

A.—I do not say " without reference to the Government of India ". It may be that they may be required to refer to the Government of India ; but the Government of India cannot insist under the Reforms Act on any enterprise being revenue producing.

Q.—This work was accepted as a revenue producing work at that time ?

A.—When it was undertaken it was not a revenue producing work. It was only a prospective work with many assumptions of making huge profits of several crores.

Q.—It was taken up as a productive public work ?

A.—Yes.

Q.—What is the extent of control exercised by the Legislative Council over such works under the Reforms ?

A.—In the budget you have to sanction and to provide any money that is wanted by the Government for such purposes.

Q.—Here you say in reason (3) of your statement " Owing to the unhappy coincidence of a combination of both the then Governor of Bombay and the Finance Member of this Presidency being very ambitious, optimistic, speculative, irresponsible and of the belief that no rules laid down any obligations on them and forgetful of the fact that under the reforms they had certain obligations to meet ".

Sir Frederick Hopkinson.—Who is the Finance Member you refer to ?

A.—Sir Henry Lawrence.

The Chairman.—This project was undertaken by the Governor of Bombay, because he wanted to push on big schemes ?

A.—Yes.

Q.—Owing to the false demand for land temporarily created during the war and as an aftermath of the war ? And the price of land was very high ?

A.—Temporarily it appeared to the public and the Government that there was a big demand for land.

Q.—At that time the public thought that this would be a very profitable work ? And was this approved by the Legislative Council ?

A.—I was not a party to approving it in the Legislative Council. Since I have been there I have always opposed it.

Q.—We have noticed that your Chamber opposed it. The scheme was sanctioned for 702 lakhs, and if the dredger had worked successfully possibly the work might have been completed for 7 or 8 crores. Then you might have had no complaint to make ?

A.—That was never possible. It was taken for granted without sufficient data. Government never cared to go into the details and never prepared accurate detailed estimates before actual commencement of work.

Q.—I admit they did not take care to secure guarantees for the performance of the dredgers. But had the dredgers been successful, had they given the required output, many of these difficulties would not have arisen ?

A.—If Government had only taken care to get the benefit of that information they had before them, they would not have launched on this enterprise at all. So long ago as the 10th June 1921 our Chamber has expressed grave doubts about the success of this scheme.

Q.—Till then you were doubting the success of the scheme ?

A.—Not only doubtful, but we opposed it very strongly in very clear and emphatic terms.

Mr. Billimoria.—Was it on the ground that the information was kept back, or was it based on any commercial knowledge that the scheme would not prove a success ?

A.—Do you want to know from me as to why I wrote that letter ? I was the president during that period. It was from our commercial knowledge and our Chamber believed at that time that that temporary demand that appeared to the Government and the public was only an imaginary and a false demand. There was really no need of any more land either for business or for housing in Bombay.

The Chairman.—Only a few saw through the scheme.

A.—Because it is proved by the results, therefore we can say so. We have challenged the figures prepared by the Government also and our committee met the Governor in this very hall. But it merely resulted in an interview with the Governor. His Excellency simply made a speech and walked away. No discussions ever occurred between the members of the committee and the Governor, although the former came here especially for that purpose.

Q.—There was no demand from the public, but there was no opposition either ?

A.—There was a grave opposition and there was a public meeting also.

Q.—There was no protest from the Legislative Council ?

A.—The constitution of the Legislative Council is such that it will not be difficult for Government to carry out any of their schemes. I will show you about the Legislative Council when you come to the other portion of my evidence. There I will prove to you that the legal demands and the very reasonable demands of the Legislative Council were not met either by the Finance Member or by Lord Lloyd.

Q.—Your next point is that there is no chance of developing Bombay any further ?

A.—That I have said in my separate statement and I will give my reasons.

Q.—Unless further developments take place in trade ?

A.—That is my humble view. I do not think there are any chances, for the reasons I have expressed in my statement, for any further expansion either of trade or of industries. It is not the result of the present temporary depression that we are passing through. If you have any doubts about the reasons I have expressed I shall give my explanation.

Q.—You are afraid that the trade is going to other parts of India ?

A.—Owing to the developments in other parts of India, namely the development of the Vizagapatam harbour which will be completed in the next five years, the development of the Cochin harbour and Karachi harbour and the development of the Western Coast of the Kathiawar States, one could easily see that these ports would divide the trade of Bombay. Bombay has a monopoly of the trade of these ports and harbours only so long as they are undeveloped.

Q.—There will be an expansion of trade if there is going to be a greater expansion of agricultural products ?

A.—Nobody would say that India is a manufacturing country. India does not supply its wants as regards manufactured goods ; it is only an exporter of raw produce. If any reasons are advanced that there will be a greater expansion of the raw produce which will come to Bombay, I can give conclusive answers. The Bombay Presidency so far is fully developed so far as agricultural development is concerned according to my view. The Madras Presidency when that is going to develop, or Bengal or the Central Provinces will all be served by the Vizagapatam harbour. The further development of the Sind Sukkur Barrage scheme should also be taken into consideration, and the Karachi harbour also is going to expand.

Q.—It will be a formidable competitor ? It has already taken a part of the cotton trade ?

A.—It will be cheaper to export from Karachi.

Q.—Is there any prospect of more industries in Bombay ?

A.—No, sir, for these reasons. I do not see that there is any industry worth the name in Bombay except the textile industry. The present depression of the textile industry I will leave out of consideration as a temporary phase. Still I do not see any chances of a further development of this industry for the reasons which I have expressed in my note. The reasons are that the internal railway freights are so high that Bombay will not be catering for longer distances by rail. And as the ports round about India still further develop, Bombay cannot supply any more goods of the textile industry in such quantities. Another thing is that more mills are built in the upcountry. Even the upcountry mills are not in such a bad plight as the mills in Bombay owing to the very heavy cost that the latter have to incur. Living in Bombay is very costly, but everything is cheaper in the upcountry, and railway freights also will be cheaper. The present tendency is that the districts are going to be served by the different mills in the different districts.

Q.—Then you have to take steps to make living in Bombay cheaper ?

A.—You can make to a certain extent, but there is always a limit. But I am not so optimistic as our Governor was from the speech that he made in the Associated Chamber of Commerce. One could easily see from that speech that he was very very optimistic from the figures that he quoted during that speech.

Q.—Which Governor ?

A.—Sir George (now Baron) Lloyd.

Q.—You do not think there is any prospect of the growth of Bombay trade in the near future ?

A.—Unless something extraordinary happens. I have referred to a very important matter, namely the idea of incurring further cost for the development of one of the docks at a cost of twenty to thirty crores. For the very same reasons which I have stated I pressed the inadvisability of incurring this cost upon the Trustees of the Port of Bombay, and my committee agreed with me and the scheme was eventually abandoned. Another thing is the Bombay Chamber of Commerce in support of what I said have raised the question that the cost of the Bombay port was very heavy as compared with the other ports especially Karachi and a full inquiry was made by the Port Trust Trustees and by members of the Chamber of Commerce, and they have come to the same conclusion that my fear is a real one and not imaginary.

Q.—You then go on to the case of the failure of the Development Department. The first point you raise is " The Honourable Sir Henry Lawrence, the Finance Member of the Government of Bombay, has failed to execute his duties as a watch-dog of the finances of the Bombay Presidency ". You have added a new point in the statement, namely, that the Finance Department did not do its duty and that is one of the reasons for the failure of the scheme. This is a new point.

A.—As your Committee has announced that you are going to examine Sir Henry Lawrence, I would simply say that all these troubles could have been avoided if the Finance Member had done his duty conscientiously.

Q.—The Accounts Department is controlled by the Government of India ?

A.—No, Sir.

Q.—Any deviations from the Account Code are noticed by the Government of India ?

A.—The Accountant General is not subordinate to the Government of India, but he reports to the Government of Bombay.

Sir Frederick Hopkinson.—Do you mean to say that Sir George Buchanan's estimate for 367 lakhs ought to have received that scrutiny ?

A.—I have developed that point further in the second part of my note. I do not hold the Finance Department responsible for any estimates. If he had followed the general rules which require him to keep a constant watch on estimates to see that they are not exceeded, this thing would never have happened. What I am stating now has been pointed out to me by the Accountant General, and I know it also as a member of the Public Accounts Committee where this was discussed fully.

Mr. Billimoria.—I wish you would explain clearly what you mean to convey by saying that the Finance Member did not do his duty ?

A.—In the Audit Report of 1921-1922, page 14, under the heading (*c*) Bombay Development Works the remarks of the Auditor General will conclusively prove to you that what I say is a fact. The Honourable the Finance Member has not been able to give a reply to this. He has been found fault with, not for any estimates as Sir Frederick seemed to suggest, but quite otherwise. He is not held responsible for looking into any costs or estimates, and this paragraph 26 (*a*) says very clearly that " unfortunately there are a few instances in which the Financial Rules have not been strictly observed.

" (*a*) The expenditure on several works in the Bombay Development Department has been held under objection for want of sanction to estimates as required by the Public Works Department Code, and this item is 1,90,54,766.

Sir Frederick Hopkinson.—Does it refer to the Back Bay Reclamation ?

A.—Yes. I have ascertained it. Out of the 1 crore 90 lakhs about 1 crore 50 lakhs refers to the Back Bay. The heading of this part that I am reading is the Bombay Development Works. In this very part it is said " In the matter of detailed working estimates for the Back Bay a similar negligence has been exhibited. The officers have been allowed to start work in certain construction of residential accommodation for themselves without any attempt to get prior sanction to the estimates ". In my report to Government I have stated that I regard these irregularities as sufficiently serious to be brought before the Public Accounts Committee, since no explanation is offered by the Reclamation Branch of this failure to observe the Financial Rules. In the meantime I requested the Government (Finance Department) to issue stringent orders to the Development Department that in future no works should be commenced before the estimate is approved and that, if possible, further expenditure on works in progress should be suspended until detailed estimates are sanctioned. The Government have directed that in future no new work should be commenced before the estimate for it is approved and any expenditure incurred on works in progress the detailed estimate of which has not been sanctioned should be reported with the least possible delay and the date on which detailed estimates will be expected to be ready should be stated.

Q.—Don't you think that in a large work of this kind where a whole estimate of 702 lakhs has been sanctioned, the accommodation for the staff should be considered a subsidiary and necessary part of the estimate and that should not require a sub-estimate ?

A.—It is only a part of it.

Q.—The housing accommodation for the staff is a part of the whole scheme which had been sanctioned.

A.—But the sum of 1 crore 90 lakhs is a very big sum and that includes the cost of the dredger.

Q.—In works of this kind it frequently happens that you have expenses to incur, the delay of which will amount to a delay of the work, and therefore works of this kind should not be held up for any official form of sanction. Otherwise you stand to lose far more than you are likely to gain. One crore and 90 lakhs is a totally different proposition.

A.—This is the period after the reforms began and this is the period in which I was a member of the Council. But I enquired about the previous year also, namely 1920 when the Development Department was started. The Accountant General and the Auditor General have pointed out that it was a very serious mistake to have borrowed 9 crores and 39 lakhs and to have kept the money without there being any want for it.

The Chairman.—There was account objection to the loan raised in the first year ?

A.—The Accountant General objected that Government had not taken care to see the loss of interest. If the estimates were prepared, then Government would know what is wanted. It is the duty of the Finance Department to see what money is required for the different departments at different times during the financial year.

Q.—" The Finance Department has completely disregarded the repeated notices given by the members of the Council as well as by the Public Accounts Committee." Will you explain what you mean ?

A.—In paragraph 3 I have stated that instead of exposing to the public the defects of the administration of the Development Department, Sir Henry Lawrence tried to minimise the Accountant General's strictures passed so early as 1921 and repeated in the next year 1921-22. Paragraph 3 says that very clearly, and if you want to know why I have said so I will support it by the first report of the Public Accounts Committee which has been submitted to the House by the Finance Member. I imagine now you know the difference between the Public Accounts Committee and the Finance Committee. The Public Accounts Committee is only to watch what amount was sanctioned by the House and what was actually spent and to criticise whether that amount so spent was properly sanctioned or if it was sanctioned without any observance of the rules. Then the Accountant General criticises and puts it before the members of the Public Accounts Committee which is a statutory body of 12 members of which 8 are elected. This was the first report. Sir Henry Lawrence was under the impression that the members of the Public Accounts Committee were not aware of their own rights in the committee. In the first place, he took upon himself, as he was accustomed to before the reforms, as if he was the only member of the Public Accounts Committee, to write the report. He held certain meetings, but at the time of submitting the report, the rules require that he should hold a meeting and consult the other members, this he did not do. This has been followed since; but I am taking the year 1921-22. I want to impress on this Committee that those rules were disregarded. In the first report that I am talking of Mr. (now Sir Henry) Lawrence took upon himself the responsibility of the whole of the Committee and never gave any opportunity to other members for which the discussion in the Council came in. In the report that Mr. (now Sir Henry) Lawrence submitted, he himself had to admit this much: that the committee on public accounts have considered the Accountant General's remarks on the Development Department and are satisfied that in one instance referred

to in paragraph 26-D of the Report the Accountant General's strictures are based on a misapprehension of the facts. I took objection to this as soon as I had an opportunity when it came before the House. I was not a member of the committee that year, but subsequently I became a member. I must say that it was very cleverly managed by Sir Henry Lawrence. He was in the belief that he could go on with these accounts without bringing any thing to the notice of the members. Generally, these financial matters are so dry that people may not like to go into them at all. But I, as a merchant took very great interest in them. This is only a report of 6 paragraphs of only one page. It was so arranged that it was brought in just before the Council was about to be prorogued. This was in 6th August 1923. It was then barely half an hour before the Council was to be prorogued by His Excellency the Governor. He thought that we would pass it in five minutes, putting it as a formal matter. But he had an opposition from me. I would like to refer to that debate about Public Accounts Committee's report, 6th August 1923, p. 543. Mr. Lawrence then tried to raise a point of order that I was not in order in discussing that thing before the House. But the President ruled that I was in complete order and I could go on with my remarks, because it was the privilege of the House under the Reforms which the Accountant General has clearly pointed out. It was then pointed out by other members of the Public Accounts Committee that Mr. Lawrence never consulted them and he has taken all the powers of an autocrat himself and signed the report.

Q.—Was there a secretary ?

A.—No ; this is signed by the Chairman (Sir Henry Lawrence) of the Public Accounts Committee. Why I refer to this debate is that the members of the Public Accounts Committee openly said that one meeting was held, that some of them differed, but he did not hold a meeting afterwards and submitted the report to the House, and he wanted to hush up these things and not to allow an opportunity to the House to discuss the thing fully. The Accountant General has done his duty. The Auditor General has done his duty very conscientiously in pointing out their duty to the members of the Public Accounts Committee. Usually, if any mistakes are committed, they will be the commonest mistakes, and these mistakes might be avoided if you took proper action at the beginning. But instead of taking any action, Mr. Lawrence went on like that not only that year but till the period of his office had expired. During the period of the five or six years, the result of his work was in two sentences. In this year, 1924-25, the Auditor General has given a distinct warning which was at once accepted by His Excellency the present Governor and a considerable portion of his speech was taken up in pointing out the financial position of the country. Here he says that " the financial position in the near future will be serious ; it is doubtful whether even the remission of the contribution to the Central Government will be sufficient by itself to ease the situation ". Even if the Government of India were to give up the 56 lakhs that we have to pay as contribution, our position of finance will still be strained.

Q.—In paragraph 6 you say, the Finance Department, if proper enquiries were made, will be found to have allowed the expenditure to be incurred by a mere order of the Governor of Bombay. Was the Government giving orders direct ?

A.—I have said that if you will make proper enquiries it will be found what the real facts are. I have reasons for it. Similar instances have occurred and I have noticed them. Of course your Committee is not concerned but if I am allowed, I can point out that the Governor has gone beyond his powers in allowing the incurring of that expenditure. The Finance Member was in the habit of doing so, and he must have done so. There was no reason why the Finance Department should have undertaken to make payments without the observance of the financial rules. This is not the only instance in which these rules have been broken, but they have been broken on several occasions, which have been reported to the public. They are no more confidential.

Q.—That may be just after the reforms ?

A.—They are not. But the Governor himself took autocratic powers, and these matters were reported to the Secretary of State.

Q.—The Legislative Council had not begun to control the actions of the Government ?

A.—If the expenditure is incurred what is the control to be enforced afterwards ?

Q.—You had not learnt to apply the constitutional checks in the beginning ?

A.—Yes.

Sir Frederick Hopkinson.—You say that the Development Department were allowed to keep big balances ; can you give me an idea as to what the balance was ?

A.—About this, the Finance Department themselves have acknowledged more than once before me. But they have improved since last year.

Q.—Can you give me an idea as to what amount of balance they had ? Any documents to show that ?

A.—I can say. My idea is that two months' advance expenditure should be kept as balance because that is the Government of India's arrangement with the Government of Bombay when they are giving them the advances. Here, in the first place, there is no necessity for keeping any balance of more than two months' requirements. They anticipate their requirements

every month. If that was so, there is no reason why they should lose money to the extent of about 50 lakhs.

Q.—It is a business proposition. Can you tell me what the amount consisted of and what was the balance ?

A.—It was more than a crore sometimes.

Chairman.—Allowing no interest ?

A.—No interest; and the Development Department will be paying interest to the Government of India which is 6 per cent., it is now reduced in the Government advances account.

Sir Frederick Hopkinson.—What is the rate of interest on which this loan is paid ?

A.—There is one loan which bears 6½ per cent. *plus* income-tax, which works out at 7 per cent.

Q.—Is the Government paying any income-tax ?

A.—The Government of Bombay have to pay to the Government of India.

Q.—What is the income-tax ?

A.—It works out at 6 to 7 per cent.

Mr. Billimoria.—1 anna 6 pies.

A.—Subsequently it was arranged that as they require money Government of India will advance them; so Government of India are advancing on the rates ruling at present.

Sir Frederick Hopkinson.—What is the ruling rate now ?

A.—It may be 5 per cent.

Mr. Billimoria.—The present average works out at 6¼ per cent.

A.—The Government of Bombay have to pay 5 per cent. on advances from Government of India.

Chairman.—At present they are paying 6¼ per cent. ?

A.—Yes. They are calculating at 6¼ per cent. because in the Kay Committee we calculated at 6¼ per cent; 7 per cent. we have to pay on 9 crores, out of which we get interest from other bodies to the extent of 4 or 5 crores, and we are paying 5 per cent. to others.

Sir Frederick Hopkinson.—At the present time the Government of Bombay has been paying 6¼ per cent. interest on the loan for the reclamation ?

A.—On the average of the loan for reclamation and on the advances; on both.

Q.—That is, you have got a certain sum at present and that is given to you at 6¼ per cent. ?

A.—Yes.

Chairman.—Was any attention paid to the warnings of mercantile bodies like the Chamber ?

A.—In regard to the conception of the scheme, in regard to its administration, in regard to its methods of working, in regard to all those details, we always protested.

Sir Frederick Hopkinson.—We want to understand as far as we can, in a short time, when did the Chamber in fact make a warning to the Government about the administration and the conduct of the works ?

A.—Just in the beginning; what they wanted was a very simple and reasonable demand and that was summarily thrown out. The demand was that this body should be conducted on the same lines as the Improvement Trust or Port Trust or such other bodies.

Q.—Advisory Committee ?

A.—No Advisory Committee; they opposed the Advisory Committee. Our Chamber have been suggesting that this matter should be treated as a transferred subject instead of a reserved subject.

Q.—Would you explain that ?

A.—If it is a transferred subject it is managed by a Minister and the Minister is responsible to the elected members, because he is one of the elected members of the House. He is responsible in this way, he being an elected member, after three years, he has to go to his constituency to seek re-election. But not so with Sir Henry Lawrence; he is quite sure of his pension.

Q.—What is a non-transferred subject ?

A.—It is a reserved subject; and the Member in charge is responsible to nobody; he is sure of his pension; nobody can touch his pay or fine him. The Public Accounts Committee goes into the frauds and mistakes committed by certain officers; they can even stop the pensions of certain officers; they can degrade them. But in the case of an I.C.S. officer, they cannot do anything, they cannot fine him or stop his pension. What they can do is to stop his promotion. In the case of a high officer like Sir Henry Lawrence, the Finance Member, you cannot do anything. Sometimes—it is often so in many cases—it is reported that some other officer was responsible for the fault and that man has retired and so they cannot help but they will take proper action in future! Even the Auditor-General has for the last three years given repeated warnings on the slackness of the Finance Department in taking proper action. That is seen in the third year's report.

Chairman.—The next point is " the demand of constitutional control being given over the affairs of the working of Development Department like the one enjoyed by the Improvement Trust, Port Trust and such other bodies was also disregarded. "

A.—You are aware of the constitution of the Port Trust. It consists of elected members with executive powers. They are mercantile people, and they go into all details. This is the instance I have quoted. In the Port Trust this conception of 20 crores dock was given up after a preliminary examination. They said that this was not the time that we should incur any expenditure. The Government have not stopped this thing even after incurring big losses.

Sir Frederick Hopkinson.—When do you mean ?

A.—Three years before.

Q.—You have incurred the worst of your expenditure ; you have spent all the money on the dredging plant ?

A.—We have been warning from 1921 when the plant was not purchased.

Q.—But it was ordered ? You could not get out of that without payment ; if you cancel the contract you may have to pay heavily.

A.—It is a very bad history—how it was ordered.

Q.—That is another point.

A.—Very little information was given to us.

Q.—Having sent for the dredger—it is a very large order indeed—you are more or less committed to the scheme ?

A.—As to the method in which the order was placed, all those remarks that I have made about incurring expenditure without detailed plans and estimates will also apply to it.

Chairman.—The advisory committee was impotent ?

A.—Absolutely impotent. About this my committee protested, and I can give you an idea of what these advisory committees are ; they are mere farce, a deception, and very little power is given to them. I protested that the advisory committee was a mere illusion to the public ; they have got no control ; no facts are placed before them. Our committee raised the question. I will point out to you the correspondence that passed between the Chamber and the Government of Bombay in our report of 1923, Appendix 73. The whole correspondence will give you an idea of the advisory committee and its powers.

(At the request of the Chairman, the witness agreed to furnish a copy of the report to the committee.)

About the calculated payment of the loan, that was never gone into by those concerned. It is the usual practice, whenever any project is considered by Government or any adventure is launched for the benefit of the people of Bombay, invite the opinion of mercantile bodies and take their considered opinion.

Sir Frederick Hopkinson.—What was the actual demand of the land in 1919 ? Was it very large ?

A.—It was never large. That is the question I have raised.

Q.—I am trying to get a few particulars. Was the demand in 1919 very great and urgent ?

A.—It was not so great or so urgent that it could not be met. During the war and after it, when the troops were disbanded, Bombay was the port at which all these transactions took place, and that was the reason why there must have been an increase of population to the extent of 1 to 1½ lakhs temporarily. That was why a pinch was felt.

Q.—There was a pinch ? But in your view, it was only temporary pinch ?

A.—Yes.

Q.—And the disbanding of the army would have relieved that to a certain extent ?

A.—Yes. But there was no pinch of the business.

Q.—There was no pinch of business or of ordinary residential requirements ?

A.—There was not.

Q.—Can you give me an idea as to what extent there has been increase in population ?

A.—To the extent of 100 to 150 thousand people.

Q.—How was this going to be met without a new area of land ?

A.—But it was only for residential purposes ; it may be met by the extension of the suburbs.

Q.—That is the answer I wanted. You think it was not necessary to take up this Back Bay Reclamation. You have got all the land you wanted by the extension of the suburbs and no member of the business portion of the Bombay City would require land on the Back Bay Reclamation ?

A.—Yes.

Mr. Billimoria.—Even to-day there are 90 lakhs of square yards available in the city.

A.—Yes. We have a very large quantity under the Improvement Trust, the Port Trust, the G. I. P. and B. B. & C. I. Railways. All these are given in the majority report.

Sir Frederick Hopkinson.—You have got at the present time more land than you are in need of ?

A.—Yes ; much more land.

Q.—How long do you think that the present area will supply the future requirements ?

A.—For at least 30 years, for the reasons I have given, if there was no development. I do not think there will be any demand for new areas.

Chairman.—Are many parts of the city not congested ?

A.—Not after the operations of the Improvement Trust. If you can refer to the census reports--

Q.—But the population per acre is very large compared to other Indian cities.

A.—Yes.

Q.—So there is congestion ?

A—Yes.

Mr. Billimoria.—In which parts of the town there is congestion ?

A.—Bhuleshwar and Mandvi.

Q.—Do you expect these people to come and live on the reclaimed area ?

A.—Never ; you can never conceive that such people will come to the reclaimed area.

Q.—What classes of people live there ?

A.—Commercial Indians and mercantile classes.

Q.—Not merchants or princes ?

A.—No. And I do not think there will be more merchants then than now.

Sir Frederick Hopkinson.—You think they will not come and live on the reclamation when it is finished ?

A.—No, Sir. When I am on this point I may say that the acting Chairman (of this Committee) can tell you better than anybody else whether you can afford or not if the income per head is taken into consideration.

Chairman.—The constitutional control was withdrawn and weakened, that is one of your complaints ?

A.—Yes. It was never exercised. The department was all in all. I can tell you that my Chamber has drawn the attention of Government on the question of getting the work done not departmentally but by inviting tenders and giving it out on contracts. All this correspondence will be found in the report of 1920-21. You will be able to see there that our warnings were utterly disregarded. I shall read that portion of it : " My committee fears that the Develop ment Department has not properly realised the gravity of the issues before the Government. The question of the development of Bombay is one of the biggest before the Government of Bombay and requires the co-operation of the people to make it a success." I have said there that it should be done after inviting and considering tenders from the contractors.

Sir Frederick Hopkinson.—That is a very small portion of it ? Your Chamber wish that the whole work should be carried out by contract ?

A.—Yes.

Q.—You still wish that ?

A.—Yes. Whatever portion has to be carried out should be done by contract.

Chairman.—The next statement is how to get the best out of this dredger.

A.—I am rather in a very difficult position. I have just read a letter from the Secretary of the Kay Committee of which I was a member that this document (showing a report in his hands) is to be treated as confidential. When you are on this subject I may have to tell you my views. The report was submitted yesterday, and signed. The secretary writes to me that this report is to be taken as confidential.

(*Chairman.*—We have not seen the report.)

Sir Frederick Hopkinson.—If the committee wish it to be confidential, we certainly must respect their wishes—until we have time to consider it.

A.—But when you ask these questions I may give certain answers based on this.

(*Chairman.*—We want the truth.)

Mr. Billimoria.—Even if you differ you can express your views.

A.—Without referring even to the Kay Committee' s views I can give my own answers.

Q.—You are in favour of completing block No. 8 ?

A.—Yes. That is the reason why I gave this heading ' how to get out of the worst job '.

Chairman.—This is after considering all the facts and figures with Mr. Kay ?

A.—Yes.

Q.—You want to complete block 8, and if possible also block 1 ?

A.—Yes.

Q.—After completing these two, you would like to stop the work ?

A.—Yes.

Sir Frederick Hopkinson.—Permanently or till further consideration ?

A.—Pernamently.

If after 30 years you want more land, there will be ample opportunities for it. If you calculate the interest you will find out that after 30 years it will be four times the sum you spend. There is no need to spend the money if you can get land even now at Rs. 15 per square yard.

Q.—If you can reclaim it at Rs. 15 a square yard ?

A.—It is never possible, even according to the Neilson committee' s report. What I say is this, even if by any chance anybody can pay Rs. 15, if the demand is to come after 30 years it will really cost you 60 rupees. There is no need to spend money now.

Q.—What strikes me is that Bombay is losing four miles towards the foreshore, and you are going to get nothing but isolated block 8 and block I. Would you like this inconvenience for all time ?

A.—For all time. What is your objection ?

Q.—I have no opinion yet one way or the other. You know it would be a dreadful eyesore.

A.—No ; Even if it is an eyesore, it is a question of whether you can afford all these amenities. I was a member of the Bombay Council for 3 years and I know the facts. We have already taxed the citizens of Bombay to the extent of 75 lakhs per year for launching on this scheme. If every year they have to pay this how are they going to improve ? It is the taxation that drives away industry, that drives away trade. How can they have happiness when their future prosperity is thus mortgaged.

Q.—Could you tell me approximately what is the capital loan of the city of Bombay ?

A.—About 56 crores, but we have reached the limit.

Q.—I am speaking of the Bombay City ?

A.—There are no different accounts of the City. It is all included in the Presidency Accounts.

Q.—This scheme is estimated to cost 10 crores to finish.

A.—Eleven crores without interest.

Q.—What proportion is that going to bear to the total capital liability of the City of Bombay ?

A.—The whole of it will be taken under the Presidency Accounts. So I cannot tell that. But taxation has been imposed upon the City alone. There are taxations which are differentiating. I make a distinction in the taxation.

Q.—What is the total capital liability of the City ?

A.—We have not got separate accounts. The whole of it is included under Presidency Accounts.

Q.—I am wanting to get a relative idea of the two.

A.—There are two bodies here : the Municipality which is the owner of the land ; and the Improvement Trust and the Port Trust. These have capital commitments to such an extent that half of their income is paid in the shape of interest. They are also heavily borrowing bodies. You, Sir, have complained about the capital expenditure of the Municipality, in the retrenchment report. You have impressed upon the Municipality the great necessity of acting on caution, that we should commit all capital expenditure in expectation of development. Even if it is an eye-sore we will have to bear as a sort of memory to the future generations.

Q.—Do you think it might be useful to future generations as a lesson ?

A.—Yes. They will not launch on such a big scheme.

Mr. Billimoria.—Fifty-six crores. Then 11 crores will be 20 per cent. of the total capital debt.

A.—Yes.

Q.—It is a tremendous amount.

A.—Not only tremendous, but inconceivable, unproductive.

Sir Frederick Hopkinson.—It is not productive if you get the land and sell it ?

A.—If you sell the land interest will accrue so much that you will get the price of the interest. I don't think any man can say that you can sell earlier than 7 or 10 years.

Chairman.—At what rate would it pay you to reclaim land, the lowest rate from your knowledge of the value of land ?

A.—As a manufacturer I cannot produce a thing for which there is no demand. So I won't reclaim any land.

Q.—True. What would be the minimum rate per square yard you would be willing to pay if you wanted land ?

A.—There is no demand.

Q.—It has a potential value. On that ground what would be the smallest rate you would pay down?

A.—On which side ?

Q.—In the reclamation ?

A.—In which blocks.

Q.—Taking the whole, an average rate.

A.—I cannot conceive. I don't think there will be any demand for blocks 3, 4, 5, 6 and 7, for a very long time and it would only be a wrong conception to conceive that land should be prepared where there is no demand.

Q.—But the City is crowded. You want open spaces ?

A.—By recommending block 1 we will get about 1,50,000 square yards for recreation. That is sufficient for 5 or 10 years. There is no necessity of any land if you finish block 1. It must be completed.

Q.—Bombay gets boom periods now and then. After 4 or 5 years you might get a boom period ?

A.—Even if it comes I cannot think there would be a demand for land.

Q.—It will be a swing of the pendulum. You have had experience of 3 years of depression ?

A.—It has come to normal. There was depression so far as industry was concerned, but trade must go on at a lower or higher price. I have explained the reasons why I don't think large industries do not mean demand for land. I cannot conceive of any industry except the textile industry.

Q.—As regards the future, do you want the work to be done by the Development Directorate or transferred to the Public Works Department ?

A.—I am strongly of opinion that the Development Directorate should be abolished. Not a moment should be lost in doing that. If the work is transferred to the Public Works Department.....I wonder that after the report that the whole scheme was conceived even so far back as 1863 the scheme was not entrusted to the Public Works Department. There was no reason why Sir George Lloyd should have thrown off the Public Works Department.

Sir Frederick Hopkinson.—Has the Public Works Department done Marine Works ?

A.—It can do any work. Of course, they have not done marine works in the past.

Q.—Have you full confidence in the Public Works Department ?

A.—I say that there was no necessity for a separate department for this reason that the Public Works Department would have followed all the rules of the Government Public Works Department Code and would not have gone so far wrong as the Development Department.

Q.—Has it ever been suggested that the Public Works Department could add marine works to their list ?

A.—I do not know.

Chairman.—If they get an expert the Public Works Department could carry out any work ?

A.—Certainly.

Q.—For any work in which they have no experience they might get experts ?

A.—I can tell you one thing. When I read the evidence of the Director of General Stores in an enquiry held by the Secretary of State, the same question asked.

Q.—What was that enquiry for ?

A.—It was about the reform of the Director-General of Stores Office, held in 1919-20. It was done in India and as I happened to work with him as a member of the Committee he submitted to us copies of previous reports and I saw that the same question was put to him, how he could purchase for all the requisitions for marine, army and Public Works Department. He replied that if Government wanted anything, say, a dredger, the order was sent to the Director-General of Stores. He at once appointed an expert on that line who consults and comes to a conclusion, just as everybody does in Bombay.

Sir Frederick Hopkinson.—If the Director-General of Stores is overbearing and thinks he knows more about what is required, the man who has to use it is very apt to go wrong.

A.—Yes. Because he has got experts he does not go wrong.

Q.—You have 3 navvies at Kandivli. Of course, that was cheaper, but not nearly so efficient ?

A.—That may be so. I wish to add here that there is another advantage in transferring the work to the Public Works Department, as that Department is under the control of Transferred Ministers.

Chairman.—Do you wish a Committee to be associated with the Department ? How do you propose to control the work in consonance with public opinion ?

A.—On the same lines as the Port Trust and Improvement Trust.

Q.—You want some such Committee ?

A.—An Executive Committee.

Q.—That Committee would have control as regards the sanctioning of estimates, contracts, etc. ?

A.—I do not think that question will arise. My standpoint is "abolish the department. Let us be satisfied with blocks 1 and 8. As money has been spent, block 1 should be completed."

Q.—Do you wish the work to be carried out by contract or departmentally ?

A.—I say by contract. But looking to the nature of block 1, I would not hazard suggesting contract, because partly the work has been done by dredgers and you depend on the " Kalu " and " Jinga " to finish it. So if it could be finished now, it would be cheaper to do without contract. You should not go to the contractors unless it is cheaper.

Sir Frederick Hopkinson.—You speak here of the " Sir George Lloyd " and say that it should be immediately disposed of.

A.—The " Sir George Lloyd " was working on block 8. Now there is no great dredging required in block 1 and I am of opinion that no more blocks should be taken up and so I said that the " Sir George Lloyd " should be disbanded and sold.

Q.—I would not prefer you to decide a thing like that. The dredger would take 10 years to sell.

A.—Sell it for a scrap value.

Q.—I do not know whether it would be wise or commercial.

A.—If you will take it, I can give you my commercial experience. It may be commercial to sell it at any price.

Q.—Supposing the " Sir George Lloyd " is able to fill up the reclamation at 8 annas a cubic yard, that is going to make very cheap reclamation.

A.—The Neilson Committee has said that it could not do at 8 annas.

Q.—Call it 11 annas, that is comparatively cheap. You cannot do cheaper any other way.

A.—Yes.

Q.—And I doubt very much the wisdom of scrapping the " Sir George Lloyd ". Supposing it can be shown that block 7 can be reclaimed at a price that will be very low. Is there any objection to filling up block 7 ?

A.—I have gone into that question and I know the figures very well and after considering it I have come to the conclusion that it could not be prepared at a further new cost at less than Rs. 25 per square yard, the cost of wall, the dredgers and interest included.

Q.—The whole cost in the future will be the actual cost of removing the dredger from one place to another. Your interest is going to be the same. It will take about 10 years for selling. I do not think there will be any people in the world to buy this dredger. In that case you would want to get anything. You can always get the scrap value.

A.—I shall be satisfied to get even 5 per cent. to get rid of further expenses. I may tell you that block No. 7 is not a commercial proposition.

Chairman.—You have calculated that ?

A.—We have. The reason is this that opposite block 7 there is so much of land available which is not sold. Another reason is that that locality will not be inhabited either by rich people or poor as it is adjoining the military land. If you develop that, it will be resided by middle class people who cannot pay any more rent than Rs. 100 per flat. So it becomes unsound commercially. At present there is so much land that it will be difficult to sell.

Q.—Would it not be better to make block 7 a recreation field and fill up block 1 and sell that for building purpose ?

A.—Recreation is not wanted in that locality. All people cannot go.

Sir Frederick Hopkinson.—You will have school children.

A.—Recreation ground is inconceivable in block 7 for school children. You cannot expect them to travel four miles, and it is even unsafe to send them there.

Q.—I have seen them on the sands beyond in block 1.

A.—It is just opposite the Prince's Street. School children can go there for playing. There are so many gymkhanas.

Chairman.—In the estimates the cost of development is put very high.

A.—We have not taken the rates at all. We have taken the cost only of dry-filling and prepared land without being developed.

Sir Frederick Hopkinson.—I do not think I agree with you. If you can fill it for Rs. 3-4-0 a cubic yard.

A.—This is not so.

Q.—That is what Neilson Report says.

A.—It cost you ?

Q.—Eleven annas a cubic yard.

A.—The estimated expenditure to complete block 7 is Rs. 56,79,000. Twenty-six lakhs of square yards is taken for roads and drains. Even if you deduct that there will be 3,40,000 square yards building area. That will mean that undeveloped land will cost you about Rs. 8 per square yard.

Q.—It will not pay you to sell land at that rate ?

A.—No. You will have to wait for 20 years when it will be Rs. 20 per square yard. If you will go into the cost by dry-filling it will be a plain thing. The dredger will be very costly.

Q.—Dry-filling is much more expensive.

A.—Even if you take that it would be better to do it after 30 years or 20 years, rather than now. It is not commercially sound to take block 7.

Q.—If you get the whole thing done by moorum filling it might costyou about Rs. 1-8-0 per cubic yard ?

A.—Yes.

Q.—The average depth is about 5 yards and you require 5 cubic yards of stuff to reclaim on square yard. That means one square yard of land will cost you about Rs. 7-5-0.

A.—You forget the cost of interest.

Q.—The cost of roads and lighting are included ?

Sir Frederick Hopkinson.—Your consideration is interest charge ?

A.—Yes. Depreciation, interest charge—all this is taken in the working cost.

Q.—Why do you say that the land cannot be sold at Rs. 50 ?

A.—There is the land of the Port Trust, of which I am a Trustee. Land which cost Rs. 15 was surrendered by leasers. They don't want the land in that locality. You also know that the Cotton Green has been vacated. There is a big land. None of the people have been able to sell. It is about a lakh of square yards. The people there are anxious to sell it to-day.

Q.—That is all vacant land.

A.—And the Military also will vacate it.

Chairman.—Where are they going ?

A.—Colaba.

Sir Frederick Hopkinson.—It is not good for residential purposes.

A.—People are residing—all Europeans.

Mr. Billimoria.—Mr. Lalji, do you think that in spite of the prosperity there will be any demand for land on the reclaimed area.

A.—Unless you imagine increase of population, and the increase of population can only be considered when there is more trade or industry. I do not for reasons that I have expressed anticipate any increase of trade and industry in the near future.

Q.—You don't expect or look forward to it ?

A.—I may look forward to prosperity, but I do not anticipate any demand for more land.

Q.—Even supposing there was boom you don't expect there will be demand for 22 lakhs of square yards.

A.—Even if there was boom. Boom does not mean there is actual demand.

Q.—In the Chamber's representation you refer to new tenants. Do you expect there will be 350 tenants every year to take up the land ?

A.—If you want I can give you some idea. Plots of Improvement Trust each of which cost Rs. 250 in the best locality and which were never vacant are to-day vacant. I can tell you that there are 6 lakhs of square yards of similar land near Worli. They have not been able to sell even one plot, in all these years except in one case transferring plot to Pochkanwala. It is a very nice area. There is no demand for it. That is a practical proof of there being no demand.

Q.—If it is impossible to get 300 tenants for a number of years who would be prepared to pay Rs. 450 a month to make this a business proposition ?

A.—That is the question. You can assume that, when there is an increase in income. But I do not see why income will increase, so much.

Q.—Those who can afford to pay Rs. 450 or thereabouts have already accommodation provided to them. There is no dirth of accommodation for this class of people ?

A.—Certainly. Since you have asked me that question, if you will permit me I would like to invite the Committee's attention to the general unemployment among the middle class people about which the *Times of India* has written to-day and the Government of India have also issued a press communique. That will give you an idea that hundreds of graduates are out of employment, not one or two of them, for whom we feel very keenly but we cannot offer them any service. In this condition of unemployment how can you expect there will be demand for those flats even when the rooms are vacant. There is a big loss in the chawls that we have built because there is no demand from the labourers. If there is no demand for labour because you expect to have your own prosperity from the efforts of the labourers where do you expect any more prosperity for this class who entirely depend on the profits of the labourers.

Sir Frederick Hopkinson.—This time in 1919 was not peculiar to Bombay but it was all over the world. We in England suffered as much as you suffered here but you must not be too downhearted. You have gone on for so many years and we hope we shall go on longer.

A.—But you are your own masters, you can put your house in order but we cannot. That is the whole difficulty otherwise we could put our house in a very good order and there will be prosperity and then there is no reason to be pessimistic. If we were our own masters we could do it at once.

Chairman.—Are your pessimistic statements to-day coloured by your political difficulties ?

A.—Certainly. Besides political difficulties there are financial difficulties. If the financial policy of this country were in the hands of Indians themselves its condition would have been much better and I am sure they would not have been discouraged. There would be prosperity and no case for us to complain, as at present, that we are pessimistic.

Mr. Billimoria.—On page 9 of the written statement there is a paragraph : " Misrepresentation was kept up to the last because it was in February 1925, that Mr. Baptista on the eve of the first Interim Report, was assured that all was well in these terms : ' In regard to the possibility of financial loss the expenditure has up-to-date approximated closely with the forecast ' without any hint of the important fact that the work completed for this amount of money was far below anticipations." Will you kindly tell us who made that statement ?

A.—The Honourable Member in charge made that statement.

Q.—Are you sure it was in February 1925 ?

A.—I think this is one of the replies in the Council but that is not a new thing. We were all along given to understand that matters were progressing satisfactorily until the report of one of the members of the Chambers representative, Mr. Manu Subedar, who emphasised in the minority report that information was kept back from him. It was due to the efforts of Mr. Manu Subedar who tried to expose it and went considerably deep into the transactions of the Development Department but he was not given all the facilities for which he made a complaint in the minority report. It is all due to that otherwise up till that time all the information was suppressed. It is due to his efforts that this Committee has been appointed.

Sir Frederick Hopkinson.—I do not know whether we ought to feel grateful.

A.—No, you are doing your duty.

Mr. Billimoria.—We have asked Mr. Manu Subedar to come forward and tell us what his grievances are but he is not coming forward ?

A.—He went to appear before the Tariff Board and returned only yesterday.

(*Sir Frederick Hopkinson.*—I think we have got his written statement. He said that he had nothing to add to that.)

Q.—Do you not think that there is some fallacy in the method of working the cost. The Committee in working out this cost have not taken into account interest and depreciation charges and with them the cost may go to three times that amount.

A.—I quite agree with you. Mr. Manu Subedar has disclosed this mistake which the majority people have made. They say wind up the whole affair and write off the whole as loss at 543 lakhs or 590 lakhs. But that is a fallacy, if it was a private company we could say it went into liquidation but the Government of Bombay cannot write off in this way when there is nobody to repay. Even then interest charges will be perpetual and we will have to pay interest on these borrowings. But were the Government of India to write off we can certainly say that no interest will accrue. That can be if the Government of India were to write off this amount from their own books.

Sir Frederick Hopkinson.—Even then India will have to bear it, it is a loss to India after all. If the Government of India writes it off it would mean that by transfer to India you are getting rid of it so far as Bombay is concerned.

A.—Yes. It has been a great disaster to India, somebody must pay it.

Mr. Billimoria.—If there is any chance of minimising the loss you would do it ?

A.—Yes.

Q.—And having regard to that you might change your mind with regard to filling of some of the blocks which will probably reduce the loss ?

A.—I have said so. No. 8 must be completed because there is a chance of reducing the loss. That is a commercial proposition because you have got a definite buyer. As regards No. 1 you have to spend 17 or 19 lakhs and that will bring you 4½ lakhs square yards of land. I take this view because I think when we have spent so many crores let us spend 18 lakhs further and finish this block so that you may have something.

Q.—You do not want to proceed further than blocks 1 and 8.

A.—Yes. I would stop there and see the demand for the land. If it is desired to go on because our dredgers are lying idle, I would say we should not incur any more expenditure.

Chairman.—I am asked by my colleagues to say that you have given very illuminating evidence and we thank you for it.

The Committee assembled at 11 a.m. on the 23rd August 1926

Sir M. Visvesvaraya.—In the course of the examination of witnesses on Saturday last I remarked that what the Committee wanted was correct information and if reliable facts and figures are given by witnesses, the Committee will form their own conclusions. I want to repeat that statement to-day and to add that that is also the opinion of our Chairman who is prevented by indisposition from attending these meetings.

35th Witness

Mr. J. A. Kay, Chairman, Bombay Chamber of Commerce

Sir M. Visvesvaraya.—What is your Christian name ?

Mr. Kay.—Joseph Aspden Kay.

Sir M. Visvesvaraya.—We received your Committee's Report on Saturday but have not been able to check any of the details but we shall only ask you questions about your general conclusions. You have based your conclusions on the recommendations of the Neilson Committee ?

A.—We have based our conclusions on the figures and estimates of output but have not taken into account the actual figures of cost for reasons pointed out in paragraph 3 of the Report which is already forwarded.

Q.—But I suppose you have taken the figures as correct ?

A.—Well, we have taken the figures as correct as arrived at by the Neilson Committee.

Mr. Billimoria.—Was there no independent inquiry ?

A.—We were not called upon to make any independent inquiry on the figures. If you will refer to paragraph 3 of our terms of reference you will find from that all the figures to the Neilson Committee were given and prepared by the Engineers of the Development Department.

Sir Frederick Hopkinson.—If the basis of figures from the Neilson Committee's Report are in any way incorrect, then your conclusions are incorrect ?

A.—That must be so, Sir.

Q.—And if we find that it is necessary to alter the figures of the Neilson Committee then your figures will be altered too ?

A.—They must.

Sir M. Visvesvaraya.—You have taken the rate of progress from the Neilson Committee ?

A.—Yes, Sir, as indicated on page 3.

Sir Frederick Hopkinson.—That's also dependent upon the report of the Neilson Committee and if it is not materially correct to some extent then your report would also be incorrect to some measures ?

A.—Yes, Sir.

Sir M. Visvesvaraya.—Then the rate of progress must also be altered similarly ?

A.—Of course, but in doing so one can attach importance to the figures given by some technical engineers who know this kind of work.

Q.—Can you say that moorum filling can be done at a cheaper rate than what the Neilson Committee has said ?

A.—Well, I cannot answer such a question, as I have no knowledge.

Q.—Can you say from your personal knowledge that moorum can be brought down from Kandivli at a cheaper rate and more quickly than at present ?

A.—It all depends upon the facilities afforded by the railway department but as to rate I am not prepared to express an opinion.

Q.—There are now two railways in Bombay and you can get moorum from both sides. From your own knowledge of that locality can you say that moorum can be brought down at a cheaper rate and more speedily ?

A.—I have nothing to add to my previous reply.

Q.—With regard to establishment charges you have increased the percentage from 13 to 15 per cent. ?

A.—Of course, this higher figure is even now taken in the departmental estimates and we consider, looking to the fact that the actual programme of work which we recommend is a restricted one, being in most years considerably below Rs. 30 lakhs of capital expenditure which the Neilson Committee assume for next season, it is reasonable to suppose that the incidence of establishment charges will be somewhat higher.

Sir M. Visvesvaraya.—You assume rate of interest at 6 per cent. I think it is a reasonable rate?

Q.—We now come to page 6 with regard to present financial position. The total expenditure on all works including establishment, etc., connected with the Back Bay Reclamation Works, up to 1st July 1926, is Rs. 590·91 lakhs?

A.—That is a matter of fact.

Mr. Billimoria.—You assume that the realisable value of the plant if sold would be 25 lakhs?

A.—Yes.

Mr. Billimoria.—Do you remember that an original estimate for this plant as arrived at by the Advisory Committee was Rs. 75 lakhs, and you now reduce it to 25 lakhs?

Sir Frederick Hopkinson.—Perhaps you have not gone into this matter, you are giving somebody else's figures?

A.—No, we discussed the matter with the Director of Development and we had before us a list of the plant and in view of the difficulties in disposing of plant of the same description we assume first that it would be difficult to get a ready buyer and consequently we have to take its saleable scrap value as it is very difficult in these times to get a purchaser for the whole lot.

Sir M. Visvesvaraya.—Have you any personal opinion to offer as to what would be the price after 3 years?

A.—Well, my experience tells me that in these days of hard trade depression it won't give any return at all.

(*Sir Frederick Hopkinson.*—Perhaps it is a liability rather than an asset at times.)

Mr. Billimoria.—What do you think is the scrap value of these dredgers and the plant?

A.—I am not in a position to tell you as I am not an expert, but 25 lakhs also cover other plants and tools.

Q.—Taking everything into account that is a conservative figure?

A.—To my mind it is a reasonable figure to take.

Sir M. Visvesvaraya.—On 1st October the debt will amount to 580 lakhs after deducting the realisation from sales of plant, and then if the work is scrapped the total annual charge will be 45·14 lakhs, *i.e.*, if nothing is done and the work is left incomplete as it is now?

A.—That is conditional, Sir. My reply to the previous question is on the assumption that the charge is made for sinking fund at 4 per cent. together with interest at 6 per cent.

Q.—You have not suggested how you want to liquidate this liability on the Presidency?

A.—We were not asked to do so.

Q.—How would you suggest it should be done? Can you give us your personal opinion on the point?

A.—I think the question of finance, of loss on the Back Bay scheme needs separate and careful consideration, because if it is going to result in a heavy interest charge on the general revenues of the Province, it is going to be a serious matter. Now we are faced in this province, or shall be faced in the near future with certain financial difficulties. We have no expanding revenue and there is an ever increasing demand for money for nation building subjects. Some time ago the Chamber of Commerce addressed Government on this very important matter as to what effect the heavy borrowings in the Presidency for unproductive and productive works was having on trade. I might put the papers in, Sir. I shall give you 3 copies of the Chamber of Commerce's letter and the Government's reply. My point is that the Presidency is not in a financial position at the present time in spite of the fact that our credit is good to bear general revenue charges for interest on unproductive work. We have already had borrowings for unproductive works.

Mr. Billimoria.—You suggest that the Government of India should come in the way and help the province by way of remission?

A.—The Chamber of Commerce has asked on more than one occasion for certain revisions for the general finances of the province, and in view of the Taxation Committee's report, I do not think one can say very much more at the moment with regard to it.

Q.—But when the Meston settlement is set aside I hope you would be more happy?

A.—I do not think it would be possible to do so. There are certain parts of the Meston Award, say, for instance, Devolution Rule 15 which deals with Income-tax and if as the Hon'ble the Finance Member said this should be reversed we will get our proportion of expanding revenue.

Sir Frederick Hopkinson.—You would like to say to the Government of India that it is much more blessed to give than to receive?

A.—It all depends under which and what circumstances, Sir.

Q.—Coming to your main conclusions, you have come to the conclusion that if block 8 be completed 190·60 lakhs will represent the present value of the reduction of debt, and therefore you have no hesitation in urging that the reclamation of this block should be completed.

A.—It is so.

Q.—With regard to block 1 you have on page 12 given your recommendation. The sale of the building plots would result in a further reduction of debt of 23·24 lakhs, and on these facts you have come to the conclusion that the reclamation of block 1 should be proceeded with?

A.—That is so, Yes.

I think, Sir, before you begin with block 2 that you may like to see the layout, because it may affect the questions on land values. (The witness submitted revised plans and explained them and summarised the explanation as follows:—)

"I submit revised plans of blocks 1, 2 and 7 as prepared by Mr. Stamper, the Acting Consulting Surveyor to Government. These plans have not been approved by the Government of Bombay, but have been submitted to my Committee in view of the decision arrived in regard to the Bombay Government having decided not to build Government offices in block 2. I point out the difference in block 1 between these plans and the original layout of Mr. Davidge. It will be seen in the revised plan that Mr. Stamper has provided for practically the whole of the land on the sea front on the west side of the recreation ground being for building purposes. These sites in addition to all the other sites along the sea front must be of considerable value if the reclamation is completed."

Q.—In the course of your remarks on block 2 you say with a longer pipe line the output may be so considerably reduced as to bring the cost of dredged filling into this area above the price of dry filling, in which case dredging might cease to be a profitable proposition, and if murum filling is to be done, Rs. 5·79 per brass is likely to prove adequate?

A.—Yes, Sir, we say that.

Q.—And you proceed to say that the possibility of doing reclamation by contract agency should be thoroughly investigated. You have no opinion yet, but there is room for further study?

A.—Yes, we say so, Sir.

Q.—Won't you go a little further and express your opinion as to the difference between carrying out the work by contract and departmentally?

A.—Dealing with it as far as that report is concerned it is a matter of price. If you can undertake and complete the work cheaper departmentally and as efficiently, I see no reason why the Department should not continue.

Q.—What is your opinion as to whether it is practicable or possible to do it more cheaply and expeditiously by contract?

A.—It is quite a general question. The general reply too is it is both practicable and possible to complete the work by contract.

Q.—Can it or can it not be done better or so well as departmentally?

A.—Well, there are good and bad contractors, and there are good and bad departments.

Q.—Assume the best contractor and the best Departmental work?

A.—I should favour the work being done by contract. In principle I am in favour of that.

Q.—At the end of paragraph 16 you say the present value of the extra cost of building block 2 is 29·80 lakhs. You say the sale of these 2 blocks, Nos. 1 and 2 would result in a further reduction of the present outstanding debt by 22·28 lakhs. The reduction of debt resulting from the development and sale of block No. 1 only is 23·24 lakhs. On the whole by doing block 2 you will not reduce the debt, but increase it by a lakh of rupees?

A.—Yes, we point that out.

Q.—On the whole you are of opinion that block 2 should be taken in hand and completed?

A.—The findings of my Committee are that blocks 1, 2 and 8 should be completed and no work should be started on block 7.

Q.—You are not against the use of murum for filling block 2? In fact it may be necessary?

A.—Not against it. It is a matter of price. We have pointed out the difference there, Sir. We go upon the Neilson figures. Cost for dredged filling is Rs. 4·87 and for murum filling is Rs. 5·79.

Q.—Dredged filling takes longer to consolidate?

A.—It depends on the kind of filling you are getting. I cannot conceive the filling in block 1 would take so long a time to consolidate as the filling in block 8.

Q.—The reduction of debt by doing blocks 8, 1 and 2 would be 143·01 lakhs. And you give the present value of the extra cost of block 7. Of course block 7 you do not propose to develop?

A.—In all cases cost of development is included and reduced to present value.

Q.—And then when you come to block 7 you get into a region of doubt and difficulty. And you come to the conclusion that block 7 should not be proceeded with at present?

A.—We have, Sir.

Q.—And you say the filling of foreshore areas in blocks 5, 6 and 7 should be carefully investigated. May I ask what your object is in making this suggestion ?

A.—I should like to explain this once more. You see, Sir, this is Cuffe Parade here. The foreshore here in Cuffe Parade is shallow. There is rocky foundation there, and there has been silting up and leakage from block 8. The suggestion put before us by responsible men was that if further land is necessary there it is easy to reclaim from the end of Cuffe Parade to a line, say the middle of the suggested wall. It would give you, if the development goes on in years to come, an entrance to block 7, because at the present time the only road leading to block 7 would be the Cuffe Parade road.

(*Sir Frederick Hopkinson.*—There is a good deal in what you say. For instance, if you made up that shallow piece of foreshore there, those two recreation grounds could be used instead of that one on the sea front.)

Q.—As a rule the depths in these blocks 3, 4, 5 and 6 are greater than in others ?

A.—Then you will have to make a further investigation to see whether from a short distance from the shore the depth is all right.

(*Sir Frederick Hopkinson.*—As a matter of fact I have arranged to go and examine the cross sections on Wednesday with a view to what you have just mentioned now.)

Q.—The blocks will have to be considered in parts, not as a whole ?

A.—I think it could be considered as a whole.

Q.—The depths are greater here than in the blocks already reclaimed.

A.—I do not know, Sir. Near the wall, yes. Near the shore for a short distance it is all right.

Q.—Your conclusions at present are the present value of the net loss would be 400 lakhs. The reduction of debt on completion of block 8 would be 190·60 lakhs and further reduction on completion of block 1 would be 23·24 lakhs, and no further reduction on account of block 2, but there would be a slight increase. If block 7 is completed there would be a further increase of 11·53 lakhs. These are your general conclusions, and from this you say blocks 1, 2 and 8 might be proceeded with at once and 7 might be held in abeyance ?

A. We say work on No. 7 should not be commenced.

Mr. Billimoria.—What about the dredgers lying there. Don't you think rather than scrap the dredgers altogether it is better allowing them to pump in block 7 and keep that area available awaiting disposal ?

A.—That all depends on when you think you could dispose of the land. You find in paragraph 30 that we discussed this and reported on it in a separate paragraph. To my mind a lot of the misconception in regard to this Back Bay Development scheme is due to the fact that too much attention has been paid to the costs of reclamation and not enough to the cost of development, and secondly to the all important matter of throwing land on the market and the period of years it is going to take to sell and the price. After all what is the good of creating land for sale if you are not going to be able to sell. Now if we go into the figures as far as you find it may be reclaimed for a certain amount of money. We considered whether it was possible to recommend it should be left as an open space. You know that money at 6 per cent. compound interest doubles itself in 12 years. If that costs say Rs. 30 lakhs and you did not sell any land you are saddled with a debt in 12 years of twice the amount.

Sir Frederick Hopkinson.—Surely if you pay interest on your capital every year, the capital does not increase ?

A.—But you have to pay the interest.

Q.—Another way of putting it is that it costs you so much a year by way of interest. You have lost your original capital and the possession of this land costs you so much a year ?

A.—But I think the correct way to state it is that money doubles itself in 12 years at 6 per cent. compound interest.

Q.—Suppose you borrowed money at 6 per cent. and bought a house with it. If the house lies unoccupied, it will cost you by way of interest 6 per cent. of the capital ?

A.—Yes.

Q.—In that case you speak of it as an annual charge for so many years ?

A.—Yes.

Mr. Billimoria.—When the property is to be disposed of the owner will expect to get both his capital and interest. If he does not get it, so much is lost.

Sir Frederick Hopkinson.—If you keep a property for ten years you cannot expect its value to be doubled by the mere fact that you have had it for ten years.

Mr. Billimoria.—This land will not be valuable if it is kept for ten or twelve years.

Q.—With regard to the sentiment that is now prevailing as to the scrapping of the dredgers, in view of the fact that we have spent very nearly 1½ crores, do you still feel that it is no good proceeding with block 7 ?

A.— We have not said so.

Q.—But what would be your conclusion?

A.—The question of what is going to happen to the dredgers brings up also the question of what is going to happen to the Development Department, and I am not prepared to express an opinion. It is not included in our terms of reference.

The Chairman.—If the working of the dredgers improves, you have no objection to their being used for two or three years more?

A.—If you read Mr. Neilson's report you will find that the information is so scanty that I am not prepared to make any statement on an assumption that the dredgers will improve. I will only refer you to our report where we have considered the effects of what has happened in the various blocks. Beyond that I am not going to assume that the dredgers will do more or less. There has been so much speculation in this business.

Q.—You are in favour of further and thorough investigation and calculations in regard to the working of the dredgers? A lot of information is yet indefinite and collection of further information is necessary?

A.—We have not said so, and I have no reason now to change the decision which the committee of responsible men gave two days ago.

Q.—In the various stages of the report you have mentioned that information is undefined and that your conclusions will have to be altered if your information changes?

A.—We have said that with regard to block 2.

Q.—Not only in regard to blocks, but also in regard to rates, output and so on. You are not quite sure that the information given is correct?

A.—There is no doubt, Sir, in this respect unless you can point out one to me. To me it is perfectly clear that our rates and quantities are based on figures given by a Technical Engineering Committee. We have issued a warning in regard to block 2, because block 2 was not investigated by the Neilson Committee. We had to take for purposes of reference the figures which Government gave us regarding block 2. We have to take those figures and we rightly issued a warning that the rate for dredging in block 1 was very high and that they had got very near to murum cost. We have issued a wise warning that every care should be taken in dredging the area and that possibly dredging there should be rejected.

Q.—You want the thing to be fully investigated before arriving at a conclusion?

A.—Extreme caution should be taken before block 2 is commenced.

Sir Frederick Hopkinson.—You may remember a question I put to Sir Lawless Hepper on the first day of the meeting. I said "after three years experience with these dredgers surely you have not anything to learn about dredging."

The Chairman.—Have you considered what might have been the cost of this whole scheme had they decided on dry filling from the commencement?

A.—No, Sir.

Q.—Could you kindly consider now? The total quantity is about 28 million cubic yards.

A.—I would not care to consider it now. I would require notice of that question.

Q.—Unfortunately we have had no time to give you notice, but the main point is that 28 million cubic yards have to be filled in. At the rate of Rs. 1·50 per cubic yard the cost would be 420 lakhs.

A.—Not necessarily so. I cannot agree with that. First of all if you ask what is the estimate for the Back Bay, I want to know what period of years it would take to reclaim and develop and dispose of the land.

Q. As an Engineer you could tell us whether it would be possible to fill in for 420 lakhs on the basis that 28 million cubic yards are required? You want to arrange for the filling and then spend some money for the development. I will leave out development for the moment?

A.—I am not prepared to say that now. I am not prepared either now or at any other time to consider the Back Bay reclamation purely from the point of view of reclaiming land. I submit that is where mistakes have been made. There is more in the scheme than merely reclaiming land.

Sir Frederick Hopkinson.—Is it not quite obvious that, had there been no cheap dredging material available, the scheme would not have been started? Without going into any figures is it not quite obvious?

A.—I agree.

The Chairman.—Mr. Neilson also said that it is not a dredging proposition?

A.—Without referring to evidence, Sir, I am not going to refer to newspaper reading. I think Mr. Neilson referred to dredging from the Back Bay and not from the harbour.

Q.—He made a general statement that this was not a dredging proposition—I mean the scheme as a whole?

A.—I am not responsible for this statement, Sir, and I cannot give you any views.

Q.—What are your individual views, without committing your Committee, on the question whether it would not have been much cheaper to reclaim land by murum

filling from the very commencement? Whether you could not have done it for 5 crores by this method only without resorting to dredging at all?

A.—The question does not arise. I have just given a reply to a question which prevents that being asked. Sir Frederick just asked me a question which covers it.

Q.—You have not given us any views about blocks 3, 4, 5 and 6 what should be done with them in the future? Would you advocate their completion by dry filling?

A.—I would not advocate any further work being undertaken, not even in block 7, until it can be shown that it is going to be a commercial success.

Q.—Assuming it has got to be carried out and that it is considered to be remunerative, in what way would you fill them? You know there are difficulties in pumping by the dredgers on account of the length of the pipes?

A.—It is obvious, if it is cheaper to do it by dredging than by murum filling, the former is better: otherwise the latter.

Q.—When blocks 1, 2, 7 and 8 are all completed, and they are dealt with in the manner you recommend, the present value of the debt remaining would be 476·86 lakhs?

A.—Allowing for the receipt of 239 lakhs from the Government.

Q.—If you resort to dry filling for the remaining blocks which required 24 million cubic yards, the cost would come to about 320 lakhs more. What I am driving at is this. If you spend in addition to these 475 lakhs another 320 lakhs, you will have completed the whole reclamation, with the exception of the development portion?

A.—I am prepared to accept your statement.

Q.—Is there any possibility of the public being satisfied with such a state of thing, *i.e.*, completing the whole thing except the development of blocks 3, 4, 5 and 6?

A.—I do not think the public can be satisfied with something which is going to saddle the Presidency with a heavy loss. On the other hand they may be satisfied provided you show them that possibly they will not be saddled with a heavy debt and that this scheme will give them a certain amount of space which is badly required for public purposes. But I would like to point out the fallacy of talking about the Back Bay reclamation purely on the figures of the cost of reclamation.

Q.—But this is an important city with a congested population and you want more open space in this part. There is a demand for open spaces even now. We are at the bottom of a great depression and there is pessimism all round. Would it not be well to finish the whole thing? I am just asking you for your opinion. Would you like to complete blocks 1, 2 and 8 as you say and fill up the remainder and go on developing it gradually, *i.e.*, without spending much money on development all at once?

A.—That is a broad theoretical view. But as a business man I want to come down to the real facts of the case. Their first idea was that the Back Bay should be reclaimed so as to give us the space which is required for buildings. We were told that there was going to be a profit on it.

Q.—It is because the profit has failed to come that you are discontended?

A.—Whether it is for open spaces purely or for reclaiming and leaving it open for development, whoever puts that scheme forward, must give the figures and prove to the commercial community of Bombay what the net loss is going to be; because you must estimate the period during which you can dispose of this land and the number of years it is going to take to develop. And that is why in substantiation of our figures we have endeavoured not merely to put forward a programme of work, but we have also endeavoured to give the figures about the period of time it would take.

(*Sir Frederick Hopkinson.*—This scheme is either a commercial proposition or a proposition for increasing the open spaces. If you look at it a commercial proposition, you have a totally different point of view from the view of finishing it off. Once you apply tests of commerce, we cannot apply the other.)

Mr. Billimoria.—You do not want open spaces at a tremendous cost?

A.—I am not prepared to develop land at a tremendous cost and saddle the presidency with a further heavy burden.

The Chairman.—You have shown the lay-out of blocks 1 and 2 and also of block 7. How do you propose to finish the remaining portions of the foreshore?

A.—I would like to finish the wall—I would be delighted to finish it. We had no figures before us, but we did consider it from the engineering knowledge we possessed. It is calculated to cost another large sum of money.

Q.—Have you any views on the marine drives?

A.—I do not think we can afford to pay the price at present.

Q.—Assuming for a moment that the land is reclaimed over the whole area, would not the Municipality find it advantageous to lay out the grounds themselves?

A.—I am not a member of the Municipality, but I do not think the Municipality will take over land at an exhorbitant cost.

Q.—What are your ideas about the future management of the works? Would you leave the Development Directorate as it is or transfer the works to the Public Works Department?

A.—I am not in a position to go into the question of the Development Department. To me it a matter of careful investigation.

Q.—As regards the Advisory Committee or the Executive Committee, have you any suggestions to offer?

A.—We suggest in paragraph 34 that the Advisory Committee should become an executive body on lines similar to the body which controls the work of the Improvement Trust and the Port Trust.

Q.—Are you in favour of the work being carried out by contract agency?

A.—That I have already stated.

Q.—Are there any other suggestions which you wish to make for bringing this work to a speedy conclusion, either partly finished or otherwise?

A.—A reply to this is contained in my committee's report.

Q.—Can you favour us with any views of your own?

A.—On the scheme as a whole, yes. My private view on the scheme is that as years go by it will have to be completed. I would not proceed with any work of any magnitude until we have disposed of the portions which we have proposed to reclaim. As the demand arises, I would proceed with further development.

Q.—As the expenditure on filling gets less and less?

A.—That would have to be taken into consideration in conjunction with the rate at which we can sell the land.

Sir Frederick Hopkinson.—Would you mind looking at the bottom of page 16. You say that out of the gross area of 496,000 square yards the net area available for building would be 264,000 square yards. Is not that rather a small proportion?

A.—It is, Sir. But we have taken the area from the plan submitted. If you refer again to that plan you will find that the town planning as set out provides for very wide roads. I take it that town planning is very different from estate planning, because the quantity of land reserved for roads differ. In the initial lay out of this scheme the roads are very wide.

Q.—How wide are they?

A.—They vary from a hundred to a hundred and twenty feet.

Q.—You will probably agree with me that those could be reduced very considerably?

A.—Yes, I think so.

Sir Frederick Hopkinson.—You refer on page 19 of your report to a map prepared by the Superintendent of Survey and Land Records showing the sales of land in the immediate neighbourhood of the Back Bay during the last fifteen years. That is the information I have been trying to get for a few weeks. You also refer to maps prepared by the Bombay Port Trust, the Improvement Trust and the Municipality showing lands available or likely to be available for sale in the near future.

The map was shown by witness and was examined.

At the request of the Committee the witness furnished the following maps and statements:—

(1) A municipal map showing the amount of land owned by the municipality for sale;

(2) a map of land, owned by the Port Trust immediately available, available but not developed, and of land shortly proposed to be made available; with a statement showing the areas and the prices expected to be realised;

(3) similar information with regard to the Bombay Improvement Trust;

(4) a plan showing land available for sale at present east of Colaba.

Sir Frederick Hopkinson.—You will realise that it is extremely difficult to arrive at any basis for framing the value of land which may be required. In order to do this, not only did we have all these maps gone into closely, but we also viewed the matter from the point of view of the density of the population and development of certain areas. And the conclusions of these very general discussions were taken into consideration when we fixed the land values. I should like this to go on record. It appears to me that this very valuable information has come to us more or less in the nature of an accident.

Witness.—It is one of the first things we did.

Q.—As part of the Government case? If you had not reported it as you have, we should not have had it to-day.

A.—It did not come to the Kay committee by accident. I think it was part of our duty to investigate it.

Q.—But if your report has not been presented just now we should not have had this information, the most essential information. This is what I presume you refer to in the middle of page 26. "There is already or will be in the immediate future a very

large area of vacant land suitable and available for residential purposes." This statement that you put in to-day will give all those areas.

A.—They will give that, Sir.

Q.—In paragraph 30 of your notes you say, that as regards block 7 you do not consider it a paying proposition financially?

A.—That is so, Sir.

Q.—In paragraph 33, you say that as a whole the reclamation project is not a practical financial proposition, by which you mean that it will not pay?

A.—Not, with the figures before us; as far as I can see it does not appear to be a sound financial proposition.

Q.—On that score alone it would be advisable to drop it?

A.—Yes.

Q.—Again, you say "we have been assured that the sea wall is practically a permanent structure." Who gave you that assurance?

A.—The Director of Development. We particularly asked that question.

Q.—He had said specifically that it was a permanent structure?

A.—He led us to believe that there was no doubt about it.

Q.—It is only very partially finished. Assume for a moment that it is not a permanent structure, and in the next monsoon you have very heavy gales and it is washed away, what is the position then?

A.—The position is that the wall is washed away.

Q.—Very serious, is it not? If you should ever in future desire to finish the Back Bay reclamation you have got to begin the wall over again.

A.—Practically.

Q.—The wall was not designed to stand alone; it was designed to stand when supported from behind?

A.—Yes.

Q.—If you do not put that support behind, the engineer might reasonably say he is not to blame if the wall is washed away?

A.—That is possible.

Q.—Nothing has appeared yet to show that the engineer had instructions to design a wall that would stand without support?

A.—I have not investigated from that point of view. I am prepared to accept that.

Q.—I am just putting it to you; if this wall which you have been assured is a permanent structure is in fact not a permanent structure the position would be infinitely worse than it is to-day?

A.—If you have lost your sea wall probably there will then be no question of development for all time?

Q.—Therefore it should be a consideration in deciding whether to finish the scheme or not?

A.—I cannot reply to that, Sir, because I have been assured the wall is a permanent structure.

Q.—But I am going to assume that it is not a permanent structure; because obviously it has not been built to be a permanent structure without support. Would not that alter your views somewhat?

A.—Yes.

Q.—As to the desirability of completing the scheme?

A.—No.

Q.—Why; you think it should not be allowed to fall down?

A.—I don't say so, Sir, but it is possible from an engineering point of view, to support it somewhere.

Q.—Would you be prepared to spend the money necessary to support it?

A.—If there is a prospect of completing the scheme in some future time, yes; and in view of the assurance given by the Director, if the work which is to go on for the next three or four years.

Q.—The next monsoon may be a very severe one and the wall may go; so, you cannot put it off for three or four years, unless you are absolutely satisfied and certain that it is going to be a permanent structure.

A.—You have reasons for assuming that this is not going to stand?

Q.—I am not assuming, I am suggesting the possibility.

A.—Before I can reply, I think I shall want an engineer to tell me how long the wall will stand.

Q.—It depends on the nature of the monsoons; the monsoons are not all of the same character? Some are worse than others. It might stand four monsoons and disappear on the fifth.

A.—I am not prepared to agree. This is your view.

Q.—What, I really wanted to know, was your authority on what I call a large subject like this ?

A.—That is in the Director's report.

Q.—Your report is made for the Government ?

A.—Yes, for the Government of Bombay.

Q.—It is not public property for the moment ?

A.—Not further than what must be properly known in the discussion.

Q.—Can you give me any idea of the amount of debt in the Bombay Presidency ?

A.—Outstanding debt ?

Q.—Yes ; can you give me figures ?

A.—Yes, Sir.

Q.—And also of the Municipality, the Port Trust and the Improvement Trust ?

A.—You have to ask those particular bodies ; they could give the information.

Q.—How long have you been connected with Bombay ?

A.—For about 18 years.

Q.—So that I can take it that you are well acquainted with the several parts of the city ?

A.—Yes.

Q.—Can you give me any idea now as to the areas of land available in 1919 ? I want to contrast the position in 1919 with the position you give to-day ?

A.—That can be obtained ; the various bodies will gladly furnish you with the charts if the Secretary of the committee writes to them. Because that has a distinct bearing on the necessity for commencing this Back Bay Reclamation.

Q.—Supposing this Back Bay Reclamation scheme had not been started in 1919, could land be obtained at a reasonable price any where near Bombay ?

A.—Not in 1919.

Q.—Could it since that date ?

A.—Yes, since 1919 ; because there was trade slump, you had a reduction in population in the city.

Q.—Reduction in population won't increase the land ?

A.—That would release certain sites.

Q.—Not the entire buildings ?

A.—They might improve the buildings.

Q.—But have not the Development Department and the Improvement Trust been making areas of land since 1919 ?

A.—Very considerably.

Q.—That is what I am trying to get at ; and what is the relative cost of this compared with the land in Back Bay, cheaper or dearer ?

A.—It is a very wide question ; you will have to investigate land schemes all over the city.

Q.—It is a very important question. I want to realise the position that existed here in 1919 ?

A.—I have put in a small statement showing the rates at which each local body estimated the value of land to-day.

Q.—That is only values ; I am speaking of quantities.

A.—For quantities you will have to get figures from those bodies.

Q.—But have not the results of the activities of the Development Department been towards increasing the area of land available in Bombay, outside the reclamation scheme ?

A.—Yes ; in the island of Bombay and Salsette.

Q.—And the same applies to the Improvement Trust ?

A.—Yes.

Q.—What is at the back of my mind is this simple question. Suppose I ask myself this question to-day : Why was the Bombay reclamation ever started ? We know it was to reclaim a certain area of land, and what I want to know is what was that reclamation for ?

A.—If we take our mind back to 1919, we had a tremendous industrial boom here. There was shortage of housing for the working classes, the mill industry was working with double shifts, trade figures were extraordinarily high, new businesses sprang up ; there was an influx of population of all kinds from all parts of India, and generally speaking, there was also overcrowding and great necessity for building spaces.

Q.—Was any statement prepared by 1919 as to the area of land other than the reclamation that was going to be provided by the Development Directorate and the Improvement Trust ?

A.—I think there was a general statement made about Salsette ; whether the figures were made on that, I cannot remember. I shall require notice of that question.

Q.—You see what I am trying to get at; why was this reclamation started, where was the necessity for it? and in order to answer that question I wish to know some particulars as to what land was available at that time, what was expected to be required and also the quality of the land required—by quality I mean quality for building purpose, because the land at Salsette would be for a totally different purpose from land on the reclamation.

A.—I will look that up and give you the reply.

Q.—Thank you very much. I take it generally that there was not dearth of land at any time?

A.—No, Sir.

Q.—Of any kind—except for reclamation?

A.—I don't quite see that; you may want land for industrial purposes near the city which you won't be able to obtain.

Q.—But would you put an industrial building on this reclamation?

A.—No.

Q.—Therefore it is not useful for that purpose?

A.—No.

Q.—It is really required for open spaces and such business buildings as might flow from that direction, and for private houses?

A.—That is so.

Q.—Of an expansive character?

A.—Yes, Sir.

Q.—Is there any shortage at the present time for land of that character, either for commercial buildings or for private houses?

A.—There is no shortage of land, for people go out and live in suburbs.

Chairman.—In the heart of the city there is?

A.—The map will give you an idea of the land available.

Sir Frederick Hopkinson.—Is there any near prospect of the Bombay City, I mean the commercial part of the City, flowing over towards the sea?

A.—The commercial part of the city would always concentrate as much as it can near the centre of the city—near the hubbub of commerce—where the banks and offices are.

Q.—You have not answered my question. Is there any reasonable prospect of the commercial part of the City flowing over to the reclamation?

A.—I think the tendency is westwards not northwards towards the reclamation, when the Ballard Estate is filled up.

Q.—When do you anticipate the Ballard Estate to be filled up?

A.—My reply is this. There are trade cycles or periods. In the next of those periods it will be filled up. Each period lasts for five years or so.

Q.—And in that case reclamation would be available and probably necessary if trade revival creates a demand.

A.—Not the whole of it.

Q.—Part of it?

A.—Our recommendations are.....

Q.—Do they cover any extension of the business area to blocks 1 and 2?

A.—Yes. There is no reason why you should not put up offices on block 2. It is central, near the Station.

Q.—During the next cycle which I trust will come in its duly appointed time you may possibly find that even the blocks 1 and 2 will be too small an area for that purpose?

A.—Not, according to my view, Sir.

Q.—How far ahead do you think blocks 1 and 2 may under ordinary circumstances be completed?

A.—We said in our report that we think the whole of the land in blocks 1 and 2 will be sold in about twenty years.

Q.—From now?

A.—From one year after the date when development of the reclaimed area in Block 1 would be commenced.

Q.—So that if it were thought that further land would be required there is plenty of time to think about it?

A.—Yes.

Q.—Any recommendation should be governed by the time required to bring a block or any portion of it into fruition.

A.—Not forgetting the all-important factor as to when you expect to dispose of your land.

Q.—I am assuming that this trade revival would supply that. It is the tendency of all cities like Bombay to increase and the tendency of the diagram is to rise. It is a

question of rupees really whether you do this now or in the distant future. Ultimately the Back Bay Reclamation will probably be all required. But the difficulty is to say when.

A.—I don't think it would have been required if it had not started.

Q.—Do you think it was a wise or unwise thing to have started?

A.—In the days when the idea was formulated and in view of the acute overcrowding that prevailed in those days and the figures which were originally given, the idea seemed to be an admirable one.

Q.—That was in the days of Rs. 367 lakhs estimate?

A.—Yes.

Q.—Supposing that that estimate which was given in 1919 had been 702 lakhs, it might have been possible to be in your view not worth considering?

A.—It did not arise, Sir. I cannot imagine in 1926 what it would have been like in 1919.

Q.—You would have thought about it very seriously?

A.—One would have thought it an extraordinary figure. But my submission is that you cannot ask any man to think in 1926 what he would have thought in 1919 when all men were thinking in certain channels. One's thought was running in an entirely different way.

Q.—Assuming that the scheme was 367 lakhs, it would appear to be an admirable scheme. But if you were told that it was going to cost Rs. 702 lakhs you would not consider it so admirable.

A.—Obviously.

Q.—And having this figure in your mind you would be inclined to criticise and to go more deeply into it.

A.—If we had the opportunity.

Q.—You say you did not have the opportunity?

A.—No, I did not, personally.

Q.—Were you actually told that it was going to cost 367 lakhs before the Bombay Government was committed to it?

A.—I could not say that. How the figures came out I could not tell you. That will have to be looked up.

Mr. Billimoria.—Your report is a very valuable document and I must congratulate you for bringing out an able and cautious report. I take it that your opinion of land values is based on the experience of business men on your Committee.

A.—One responsible member of the Committee generally has to handle subjects of land values.

Q.—Do you propose that the work in block 2 should be completed or commenced simultaneously with block 1 or after block 1 is completed you dispose of some land and have some experience that you propose to proceed with the work on block 2?

A.—No, Sir. Not quite. If you look up our programme of work you will find that block 2 in the first year will commence after the storm-water drain is completed, by which time the expenditure would be just over a lakh. You will have to commence block 2 in any case.

Q.—You were asked some questions regarding how the cost is arrived at. As a prudent business man you will always take interest into account in arriving at the cost of an article that you are producing.

A.—Certainly.

Q.—You say that eventually it is not a sound commercial proposition to complete the whole scheme.

A.—Not on the figures we have at present of the land valued.

Mr. Billimoria—Thank you.

Mr. Kay.—Could you give a ruling in regard to the publication of this report, because this is a public enquiry and my evidence has been given to the press here.

Sir M. Visvesvaraya.—Whatever portion of the report has been discussed here is public property. Your report was made to the Government and therefore it should be given to the Government.

Sir M. Visvesvaraya.—We have had valuable information from you and we thank you.

Mr. Kay's examination concluded.

36th Witness

Mr. R. H. A. Delves

Mr. R. H. A. Delves, Chief Executive Officer, Improvement Trust, examined.

Sir M. Visvesvaraya.—What is your full name?

Mr. Delves.—Robert Harvey A. Delves.

Q.—You are Chairman of the Improvement Trust?

A.—I was Chairman until the constitution was altered last April. Now I am Chief Executive Officer.

Q.—Are you on the Advisory Committee?

A.—Yes, I am a member of the Advisory Committee.

Q.—You are one of the signatories of the majority report?

A.—Yes, I was on the sub-committee.

Q.—May I ask how many years' experience you have had on the Improvement Trust?

A.—23 years.

Q.—What is the total length of your experience of the Bombay City?

A.—23 years.

Q.—Are you aware that the Kandivli quarry was started in order to obtain stone for the sea wall?

A.—I understood so.

Q.—And they are using the same quarry for bringing moorum?

A.—Yes.

Q.—If you want moorum for filling, do you not think there are places nearer the work than Kandivli to obtain it from?

A.—There may be, but the hills in Salsette are very unsatisfactory.

Q.—Can you not get some moorum also from the Thana side *via* Dadar?

A.—No; I think it is very unsatisfactory from the eastern side.

Q.—We had some witnesses who said that they had moorum quarries ready opened between Dadar and Thana?

A.—We have recently been bringing in earth from a hill beyond Ghat Kopar?

Q.—How many miles away?

A.—That was about 4 miles from the north end of the island.

Q.—How far from the reclamation site?

A.—12 or 14 miles.

Q.—And Kandivli is about 18 miles?

A.—Yes, that is on the B. B. & C. I. Railway and Ghat Kopar is on the G. I. P. Railway.

Q.—You have signed the Kay Report?

A.—Yes, I have.

Q.—And you agree with every part of it?

A.—Substantially.

Q.—Are you prepared to give any individual opinion you may entertain which may be at variance with the report?

A.—I think that the land values in blocks 1 and 2 were put on the moderate side; personally I would put them a little higher.

Q.—Do you not think that the report has been a little over-cautious?

A.—If we erred at all we erred on the cautious side, and I think it was desirable to be cautious.

Q.—You have taken establishment charges at 15 per cent.?

A.—Yes.

Q.—If it is desired to do moorum filling and the work is done by contract do you think this high rate will be necessary?

A.—If you reduce establishment charges, the cost will be less.

Q.—It might be reduced by 5 to 6 per cent.?

Sir Frederick Hopkinson.—But you forget that contractor has to get a profit. You take from one and pay it to the other.

A.—The rate might go higher if the contractor did it.

Sir M. Visvesvaraya.—You have been guided by Mr. Neilson's report as regards rates for materials?

A.—Yes; those were our instructions.

Q.—Don't you think they have made an unusually large allowance for shrinkage?

A.—Personally I think they did in block No. 1.

Q.—You have more experience as an engineer in contract construction work in Bombay and we want your opinion?

A.—I may make it plain at the outset that I am not an engineer; I am a surveyor.

Q.—But you have been in close touch with construction work in Bombay?

A.—Yes.

Q.—Such things as rates and cost are not very highly technical?

A.—That is a matter of experience.

Q.—Do you not consider that there are possibilities of reducing the rate by improving the transport, etc. ?

(Witness)—Are you talking about the rate for dry filling ?

Sir M. Visvesvaraya.—Yes.

A.—I do not think myself that you will get below the rate that the Neilson Committee have taken.

Q.—At present there is no special organisation for bringing moorum to the reclamation area, they bring in 2 train loads from Kandivli quarry which it might be possible to increase to 7 and the quantity of delivery might be increased proportionately. It might be possible for the trucks to make more journeys than one. Also the railway may give further facilities. Then do not you think the rates will be reduced ?

A.—I do not think you will reduce the rates.

Q.—The lead may be reduced ?

A.—You may reduce the lead. If you are going to use ordinary railway trucks you will increase the charges for loading and unloading.

Q.—If the rates are altered, your figures will require modification ?

A.—Certainly. If the rate is altered one way or the other, the figures will require modification.

Q.—There is one important question I want to ask. The rate for moorum is about Rs. 1-8-0 at present.....?

A.—I am afraid we have taken it in brass.

Q.—In the report you have got moorum filling at Rs. 5·79 per brass consolidated, that is equal to Re. 1·57 per cubic yard.

A.—I have not worked out the figures, I will take them from you.

Q.—That comes to roughly Rs. 1-8-0. Do you not think there is a possibility of reducing the cost if you made proper arrangements and you have moorum nearer the work ?

A.—I would not like to say that there is a possibility unless I have examined the area.

Q.—Then assuming the rate at Rs. 1-8-0 and the total quantity of filling at 28 million cubic yards including what has been done.....?

A.—But Sir George Buchanan said it was 25 million cubic yards.

Q.—I say now : Taking 28 million cubic yards of moorum filling to be done and assuming a rate of Rs. 1-8-0, do you not think that the whole filling could have been done for 4,20 lakhs at the outset ?

A.—If your estimates are correct, the calculation comes to that.

Q.—The Neilson Committee assume a rate of 1·57 per cubic yard for moorum filling and the quantity is 28 million cubic yards. Assuming these figures to be correct, the entire filling work could be done for 4,20 lakhs ?

A.—On the figures you have given, it is correct.

Q.—Of course there might be some additional expenditure for the building of the sea wall and assuming that it could be done within 80 lakhs, it was possible to do the whole work within 5 crores ?

A.—Not within 5 crores. You will have to provide storm water drains.

Q.—You have discriminated in your report "developed" and "undeveloped area" and I am taking undeveloped area. At the figures I have given, you would have got 1,145 acres of undeveloped area at something below 5 crores ?

A.—I am not prepared to agree with that statement, because I do not know what the wall costs.

Q.—At the same time you are not prepared to contradict that statement ?

A.—No, but at the same time I do not agree with it.

Q.—Can you tell me what alternative figures you would give me for such filling ?

A.—I do not understand the question.

Q.—Supposing it was originally intended to fill the whole area with moorum only, could not the entire work have been done within 5 crores roughly ?

A.—At the figures given by you, the cost of filling would have come to 4 crores and 20 lakhs but I do not know what the sea wall costs.

Q.—The wall costs about 70 lakhs but probably it might have been cheaper had it been a stone wall. Don't you think the total cost might have come to about 5 crores for reclamation of undeveloped area ?

A.—If you get moorum at 1-8-0 per cubic yard and if the sea wall does not cost more than 70 lakhs, then you would have done the work for 5 crores undeveloped area. I have taken your figures as the basis.

Q.—I claim that by reducing the lead for moorum and also by better organisation and understanding with the Railway Department you might be able to reduce it still further and bring down the rate to Rs. 1-3-0 per cubic yard ?

A.—I cannot say.

Q.—Have you given a thought to this question? Probably you are not willing to commit yourself?

A.—I have not been asked to consider the rate of filling.

Q.—The Committee state in their report that the prosecution of the whole scheme is not a practical financial proposition.

A.—The report says: "We do not think an early prosecution of the whole scheme is a practical financial proposition". That is what the committee states.

Q.—You are individually also of the same opinion?

A.—Yes.

Q.—I am not advocating the extension of the area here but I want to draw your attention to the fact that several witnesses have stated that there is no demand for land on the island here. They say there is plenty of land available for sale?

A.—Do you mean that there is no demand for residential land in the vicinity of the Fort.

Q.—Yes, they say there is no large demand for land.

A.—I do not agree with that so far as the Fort is concerned.

Q.—What about Cotton Green?

A.—Cotton Green is of a different character.

Q.—There is land available for purchase if anybody wants it?

A.—Land is available for sale in that part of the island.

Q.—Do you not think that the city is congested?

A.—Parts of the city are terribly congested.

Q.—And the rents are comparatively high?

A.—Yes.

Q.—Are not the residences here more expensive than in London?

A.—Rents here are higher than in London generally.

Q.—Does not that mean that more open land is required in this city? Of course opening out more land means reducing the present land values but if you take existing congestion into account is it not clear that land is required?

A.—It might reduce land values in the congested portions.

Q.—But in the interest of the city as a whole it might be an advantage?

A.—I think it is an advantage provided you do not produce too much.

Q.—Don't you think the trade will grow if there is more space and the rents are low?

A.—I think perhaps individual traders will make more profit; whether there will be more trade or not, I cannot say.

Q.—What is your opinion about the completion of the scheme? You want to complete blocks 1, 2 and 8 and leave the rest of the work incomplete?

A.—I say go on with the completion of blocks 1, 2 and 8 and then proceed cautiously.

Q.—If you once break up the organisation, you might not be able to complete it at a reasonable cost later on?

A.—It is no good filling in and allowing the land to lie idle.

Q.—The city is subject to cycles of depression and boom?

A.—I am assuming average conditions.

Q.—I want to know your opinion whether there is any chance of getting rid of the land in ten years?

A.—There is not the slightest chance of getting rid of that land in ten years.

Q.—You are assuming that the prices given for this land and the period of its sale are spread out as given in your report. What in your opinion would be the value of this land when reclaimed?

A.—If you want my opinion I will give you a proper value. For block 1 I take an average of Rs. 75 and for block 2 an average of Rs. 60 and as regards the period, I think the total period of twenty years which we have allowed for these two blocks is on the liberal side.

Q.—You may be able to sell it earlier?

A.—I think we should be able to sell it earlier.

Q.—What about block 7?

A.—I look upon No. 7 as a hopeless proposition. In order to balance your expenditure on No. 7 you would have to get rid of the whole land at Rs. 25 per square yard within seven years of the date of the commencement of road making.

Q.—What were the prices in 1920 at the Marine Lines area per square yard?

A.—There was no vacant land in 1920.

Q.—Anywhere in that neighbourhood?

A.—Well Sir as I have said there was no vacant land.

Q.—In that vicinity or any other place that you know?
A.—In the Fort it was 2,000 per square yard of building land.

Q.—And the minimum prices for developed land in that area?
A.—If what you want to know is what rates I should have put on plots on the reclamation in 1920 my answer is from Rs. 80 to Rs. 100.

Q.—So the boom is not likely to recur for another ten years?
A.—I hope we shall not have any time like that of 1920.

Q.—Then it is difficult; the public won't recover their moneys?
A.—It seems so.

Q.—Your individual view we want, whether the works should be left incomplete or completed?
A.—What I have said is this, go on with 1, 2 and 8 and see what demands require and if the above blocks sell successfully then the rest of the work can be taken in hand and be proceeded cautiously.

Q.—If the work is to be carried on what are your ideas about future management?
A.—You mean after block 2 is completed.

Q.—No, in future if the work goes on, should it be done by contract or departmentally, with the same agency as at present, or by the Public Works Department?
A.—I don't think it would be fair to saddle the Public Works Department with this work.

Sir Frederick Hopkinson.—Because they have no experts who can operate upon the dredgers.

Sir M. Visvesvaraya.—Would you like to have a Committee, an Advisory Committee or a Trust or something of that sort?
A.—Well Sir, the recommendations of the Kay Committee are that the powers of the Advisory Committee be extended to the Development Department in the direction of giving them executive functions somewhat similar to those exercised by such bodies as the Port Trust and the City Improvement Trust.

Q.—You are in favour of the work being done by contract agency as far as possible?
A.—If the tenders for dry filling come out cheaper than the operations of the dredger Kalu then by all means give it by contract otherwise I should proceed as it is.

Sir Frederick Hopkinson.—It's purely a question of cost.

Sir M. Visvesvaraya.—Have you any other points to invite our attention to in connection with this inquiry?
A.—I don't think so.

Mr. Billimoria—Mr. Delves, you are a Member of the Advisory Committee that drafted that report?
A.—Yes, Sir.

Q.—You have signed that report?
A.—Yes.

Q.—That Committee did carefully consider all the factors before the report was published?
A.—Yes.

Q.—At page 2 of that report, if you have got a copy with you here you will see that the said Committee arrived at the conclusions that Government would have exercised greater caution in such matters at the same time Sir George Buchanan was the expert advisor represented to have great practical experience in the operations of dredging plant and so on, do you still adhere to that view?
A.—I do.

Q.—Then at page 3 of the said Committee's Report in paragraph 12 you say that after having satisfied ourselves that the loss on the scheme is almost inevitable? Do you still adhere to that?
A.—Unless something can be done to improve the output of the dredger if not I think there ought to be a loss.

Mr. Billimoria.—You suggest, unless something very extraordinary happens and therefore you recommend filling in blocks 1, 2 and 8.

Sir Frederick Hopkinson.—Nothing extraordinary in regard to cost.

Mr. Billimoria.—Mr. Delves, in 1913 in November you appeared before a Committee called the Development Committee and submitted a written statement which appears in this printed book at page 78.
A.—I do not know. Will you let me see it?

Q.—With great pleasure, that was as far back as 1913 when you were Deputy Land Manager?
A.—Well it refers to various paragraphs and questions and I have not got them here.

Q.—If you will kindly direct your attention to the paragraph in the margin dealing with reclamation?

A.—Yes, I see it.

Q.—What do you mean by "large and comprehensive scheme", a scheme as huge as this one undertaken now?

A.—Probably that was the one I had in view.

Q.—You were Land Manager in 1913 and you knew very well that huge blocks of land were available at the time and the Improvement Trust had entered on the sphere of activity which would bring about large developed areas in due course of time?

A.—The amount of land which we had available then or the amount which other public bodies had available then was very very much less than it is now.

Q.—But then you have certain schemes before you for the development of the town and island of Bombay?

A.—The only schemes we had before us in 1913 were scheme 31, which was quite a small one, and practically all taken up; schemes 5 and 6 between them were about 700 acres.

Q.—In spite of that did you think there was a demand in 1913 for reclaimed area?

A.—I certainly thought so.

Q.—For which class of people?

A.—I have stated it in the note I wrote.

Q.—How many are the people that exist in the island of Bombay that could utilise the benefits of reclamation?

A.—That I cannot tell you. But I can tell you this that the number of people who wish to live in comfort and under sanitary conditions is increasing every day now. When I went to live, Sir, in Marine Lines in 1912 there was hardly an Indian living there. When I left in 1923 there was hardly a European. That is so to-day.

Q.—If this area is reclaimed and gradually disposed of, as has been suggested it will require 400 new tenants year after paying about Rs. 450 a month.

A.—I do not agree with that statement. You will get flats on the reclamation at from Rs. 200 upwards.

Q.—After paying what value for grant of land?

A.—Some of it would be at Rs. 60 and some of it at less.

Q.—And taking into account the cost of building?

A.—Yes.

Sir Frederick Hopkinson.—If you take it at Rs. 50 or Rs. 60 you say it would be a profitable proposition for a landlord to realise from Rs. 200 to Rs. 400 monthly rent. When you are speaking of a flat generally, what does that mean?

A.—A flat may contain a combined sitting and dining room, a bed-room, kitchen and servants' quarters, or it may contain a separate dining room, a separate drawing room and three bed-rooms.

Q.—The first one you mentioned is a small one?

A.—Yes, Sir.

Q.—For such a flat with two sitting rooms, three bed-rooms and servants' quarters what average rent you will be getting?

A.—Rs. 400 or 450 a month.

Q.—That is £720 a year?

A.—Yes.

Q.—You can get flats in the West End of London for that. Bombay is dearer than the West of London.

A.—That is what makes it so hard for us to live.

Q.—Do you expect tenants would be coming in year after year paying these huge rents? Is Bombay prospering?

A.—May I ask how many years you are assuming this reclamation would be completed in?

Q.—That I would like to ask you.

A.—That is a question I cannot answer. It must depend on the demand.

Q.—Because it is perfectly evident that if 22 lakhs of square yards of land were to be thrown into the open market there would not be investors coming in to pay at even Rs. 50, 11 crores of rupees.

A.—I entirely agree with you.

Q.—Don't you think, Mr. Delves, we could find some public spirited men in Bombay who would come and finish the reclamation?

A.—I was wondering. It would be a glorious monument.

Q.—Do you think it is possible to find such an individual?

A.—I do not think so.

(*Sir M. Visvesvaraya.*—The reclamation may be named after him. They would be glad to name it after him.)

Q.—You seem to have made distinction between blocks 1 and 2 as regards the realisable value. In one case it may be Rs. 75 and in the other Rs. 60 and so on. Is there any reason why block 2 should realise less?

A.—Because there is more land in block 1, a greater proportion, facing on the Esplanade. And it also has what Marine Lines has, which is a great advantage, a recreation ground behind it. So you get a higher average value on that account.

Q.—You mean that proportion can be utilised by shops?

A.—I am talking about residential quarters. In block 1 you would have a station yard close to Church Gate and round it you would have some shops and you would get good value for that land.

Q.—That is the reason why you can realise a higher price in block 1?

A.—Yes, it has greater advantages.

Q.—How long do you think the area in block 1 would take to be disposed of. You have an experience of 23 years in the Improvement Trust?

A.—Five years. Five years from one year after you start road making.

Q.—When do you expect the whole thing to be ready?

A.—Well, block No. 1, we expect it to start road making in 1928-29 and to complete road making in 1930-31. We expect to begin to obtain receipts in block 1 in 1929-30, that is, one year after you start to make your roads.

Q.—You mean gradual disposal even in block 1?

A.—Certainly. In our report we allowed five years.

Q.—Do you know if prices of building material have gone down in recent years?

A.—They have come down recently.

Q.—Would that be an inducement for people to come and build in block 1?

A.—Certainly.

Q.—What is the price of cement to-day?

A.—I think the price of cement is just over Rs. 50 to-day?

Q.—Is there a duty on English cement?

A.—Yes.

Q.—You do not want to carry on the operations in block 7? You condemn it altogether from the financial point of view?

A.—Yes.

Q.—That would practically amount to scrapping the dredgers?

A.—Not necessarily. You have either got to let her lie by or you have got to sell her, or as I said before, investigate the area which I have suggested in blocks 5, 6 and 7 and then consider whether you should use her on that. Personally I should prefer to see dry filling in that area.

Q.—And from what little experience we had during the last few years you would still consider that dry filling is safer and surer ground to go upon and not rather speculative like wet filling the cost of which is unknown?

A.—I think the filling, as material in Back Bay is perfectly good. That is as far as blocks 1 and 2. But I do not like the stuff that has gone into No. 8.

Q.—Is there any material difference between the stuff in No. 8 and the stuff in No. 1?

A.—No. 1 is perfectly clean stuff. No. 8 is mud from the bottom of the harbour.

Q.—Is there any reason for that? Is it due to any handling of the dredgers?

A.—No; it is the natural stuff.

Q.—Within such a short distance between Marine Lines and Colaba there is material difference in the bed of the sea itself?

A.—Yes. Walk along the Kennedy Sea Face and you see a sandy foreshore. Get down the harbour and you find a muddy one.

Q.—Anybody embarking on a scheme of this nature ought to have had sufficient data and a thorough investigation into the quality of the material?

A.—I agree.

Q.—Do you know whether at the time the scheme was launched any due care or precaution was taken?

A.—I had nothing to do with it when it was launched.

Q.—Were you consulted?

A.—No. I was consulted in 1906 or 1907, but not after that.

Q.—If you were consulted you could have given them some solid valuable advice from your experience as connected with Bombay and having had such a great deal with land values to do in the town of Bombay?

A.—I could not have given them any advice on the question of dredging. I had no experience.

Q.—You could have given them some idea as to whether 22 lakhs of square yards of land thrown in the open market would have a demand from the people?

A.—Had I been asked in 1919 or 1920 whether on the facts and figures then known Government should proceed with the scheme or not, I should have said, "Go on".

Q.—What would have prompted you to say so?

A.—First of all the moderate estimate. And the period within which the work could have been done, and thirdly the very very pressing demand that there was for all classes of accommodation.

Q.—So the primary reason would have been the estimate?

A.—The two important ones would have been the estimate and the pressing demand that there was.

Q.—But with regard to the pressing demand you were also creating several areas in the north of the island. You had certain schemes and that would have to a great extent relieved that pressing demand?

A.—But we all thought that Bombay was going to grow, that it was going to be a centre of Trade with East Africa and Mesopotamia and various other places.

Q.—Possibly yon thought you would have some aeroplanes landed in the reclaimed area?

A.—We did have one travelling between Karachi and Bombay.

Q.—You have told us that you would now recommend to go cautiously?

A.—Certainly.

Q.—That means for another 10 years you would not think of any further reclamation?

A.—I would not say 10 years. I would wait and see.

(Mr. Walchand Hirachand of the Tata Construction Company who was recalled by the Committee was further examined.)

Before the beginning of the examination the witness wanted to make a preliminary statement in connection with Mr. Nariman's written statement given to the press. On being allowed to do so he made the following statement:—

"In Mr. Nariman's written statement published in to-day's 'Chronicle', page 11, there is a paragraph with the heading, 'other Instances of Favouritism'. That paragraph says that bricks were bought from Tata Construction by two officers, by Mr. Mehta, Executive Engineer at Rs. 32 and a Superintending Engineer at Rs. 65 per thousand. I on behalf of the Tata Construction very emphatically refute any insinuation in that statement. We challenge Mr. Nariman to produce evidence of favouritism. As a matter of fact we have never been in the favoured list, if there be any such list, of the Development Department. On the contrary they have gone past us even when in publicly invited tenders on more than one occasion we were lowest. In the whole of their big programme as contractors we have done extremely little although we consider we were organised, and entitled to a decent share, with the exception of a small department of ours, the sand department. We are writing to you officially. My request to the Committee is in case the witness is not prepared to give authoritative confirmation of these statements, in fairness to the other side no publicity should be given to such damaging statements."

Sir Frederick Hopkinson.—Arising out of that, can you give me any reason why in any one case they should select a tender higher than yours. You suggest that on several occasions tenders had been accepted that were higher than yours?

A.—We wrote and asked them officially the reasons. And we were referred to the conditions of the advertisement which stated no reasons will be assigned for rejecting any or all the tenders, a very curt reply of two lines.

Q.—Perhaps you can tell me from your wide experience whether it is an uncommon thing or not for a small sub-contractor handling moorum or anything like that to be jealous of another sub-contractor who secures the contract? Is it a common thing in India? Because Mr. Nariman spoke of and gave us a lot of hearsay about small contractors thinking others had been favoured.

A.—I do not exactly follow. Human nature is to be jealous, but as in the case of Engineers the Development Department studiously avoided local contractors with experience or organisation or reputation. All their contractors on the Back Bay were, as far as I am aware, mofussil contractors, never heard of or known in Bombay, very small contractors.

Q.—One could understand giving contracts to these very small contractors if they are going to get some advantage in price for it?

A.—That I am not aware of. During the first two or probably three years no one knew, none of us contractors in Bombay knew how these Back Bay contracts were given

out. We ourselves are not aware of having received any inquiries after the first wall tender.

Mr. Billimoria.—Was it ever suggested, Mr. Walchand, that disappointed contractors were agitating at any time?

A.—In the first place a contractor does not normally get disappointed, because every day I have a rejected tender, and if I go on disappointed, my life would be too short for it. Rejection of a tender does not disappoint us. It does not also cause that embitterment or reason to agitate. It is an every day occurrence with all contractors.

Q.—Was such a thing suggested that the agitation was due to disappointment?

A.—The *Times of India* has always been harping, as long as it was praising the Development Department and its work, and tracing the whole of this public outcry or grievance, whatever you call it, to disappointed contractors and similar reasons.

Q.—At any rate you are not one of them?

A.—I do not know what the *Times of India* leader writer meant. This was in one of the *Times of India* leaders.

Q.—You did not take that seriously?

A.—There are some people who do take the *Times of India* seriously.

(*Sir Frederick Hopkinson*: Some people take *Punch* seriously.)

Sir M. Visvesvaraya.—I want to ask you about the moorum filling. Have you done any moorum filling in Bombay city? Do you know the rates at which moorum filling has been done in the past?

A.—I have done huge quantities and specialised in moorum filling and transported by rail from my own quarries.

Q.—To what localities?

A.—Big quantities on the Mazagon-Sewri reclamation for the Bombay Port Trust filling in about 2½ lakhs of brass between Dadar and Matunga over the G. I. P. Railway.

Q.—Could you give us the rates at which you did the work?

A.—They are finished works. I do not mind giving the rates. The rate for the 6 lakhs brass, which is equivalent to if not more than block No. 2, for Bombay Port Trust filling was Rs. 4-8-0 a brass. They paid the railway freight.

Q.—But that is an impossible rate for this work?

A.—I do not think so. I do not agree that the Development can do it for the rates mentioned. Nor am I prepared to depend on those figures. The Development all along have not done any moorum filling on sectional measurement. It has always been weighed in the weigh-bridge, or it has been by wagon measurement. It makes all the difference. Mine is all net sectional quantities after settlement for one season or one year.

Q.—Where else have you done in recent years?

A.—This was going on till recently.

Q.—What was the rate for filling in of that big pit opposite the Willingdon Club?

A.—That was done from local earth within half a mile. I do not know the rate.

Q.—Can you tell us at what rate any respectable contractor would be able to supply moorum for filling in connection with the reclamation? You need not commit yourself. You may say what would be a fair rate.

(*Sir Frederick Hopkinson.*—He cannot tell unless he knows the conditions.)

A.—I have worked it. My only difficulty is, I might be exposing my case, my tender. If the Committee do not mind, I am prepared to give it "in camera". I also do not mind going into the details of how I arrive at the various details of that rate.

Q.—I think you must know your own interest. We want to know what it would cost to fill. I might tell you that the Kay Committee have mentioned a rate of Rs. 5·79 per brass which is equivalent to Rs. 1·57 per cubic yard.

A.—Rs. 5·79 per brass. That does not include the 15 per cent. of establishment.

The Chairman.—15 per cent. is a ridiculous figure if the work is done by a contractor?

A.—For the Tansa scheme Establishment came to only 2 per cent. in the Bombay Municipality. But Rs. 5-7-9 per brass is a rate at which sectional work was never done. This is a theoretical estimate. All their work was done by wagon measurement and then 15 per cent. or something has to be added.

Q.—Why do you object to wagon measurement?

A.—This is not a correct guidance. A small contractor might prefer wagon measurement, but it will lead to abuses. A respectable contractor cannot afford to accept the measurement of a petty 300 rupees surveyor. But in sectional measurement it is generally taken at the beginning and again at the end. A respectable contractor will always prefer sectional measurement and that makes an amount of difference.

Q.—You will have to remember if it may be possible for you to bring moorum from a shorter distance than they do now. You may be able to bring it from 12 miles as Mr. Delves said we could?

A.—That may make a difference of about 6 annas per brass.

Q.—You are at liberty to give definite or indefinite answers as you think proper.

A.—I shall give you some idea. I do understand the difficulty of the Committee in order to make a recommendation on this point.

Q.—I want a practical rate.

A.—I told you before that moorum is available and that contractors also are available. More than one contractor and more than one source of moorum are available.

Q.—Who could do 20 million cubic yards?

A.—Distributed over 8 or 10 years, it is easy.

Sir Frederick Hopkinson.—You have seen these conditions. If you do work on that basis, what would your price bring it to? Nearer to Rs. 10 a brass than to 5?

A.—It would be nearer 10.

The Chairman.—You may also use earth if you like?

A.—It does not make any difference.

Q.—Possibly earth may be costlier?

A.—The cost may be about Rs. 5-10-0 to 5-15-0.

(*The Chairman.*—Thank you. That is a definite figure. That does not commit you.)

Q.—What might be the lead?

A.—The nearest should be about 14 miles and 19 miles the maximum.

Q.—Now Mr. Walchand, the total quantity of filling in the reclamation is about 28 million cubic yards, or about 70 lakhs of brass. At Rs. 6 per brass it will come to about 420 lakhs. If the people who originated the scheme had started with plain matter-of-fact moorum filling, could it not have been done for less than 5 crores and the whole thing completed by now?

A.—If transport had been available, the work would have been completed by now.

Q.—With two railways near at hand, is there any difficulty for transport?

A.—No. As I said, even when the G. I. P. Railway was not quadrupled, they were able to supply me six to seven rakes. Now it should be much easier.

Mr. Billimoria.—How long do you think it would have taken?

A.—It depends exactly on the number of rakes placed at the disposal of the contractors.

The Chairman.—Three years?

A.—No.

Mr. Billimoria.—It was anticipated then that wet filling should have taken six years. This has to be done earlier.

A.—If each of our Railways agree to run 8 rakes, it would not be difficult I think to do the work in about 6 to 7 years by dry filling.

Q.—Without hampering the traffic?

A.—I am not a railway man, but as far as I can see, even in pre-war time, they could run for me 6 rakes and they allowed me to run it on the main line. With quadrupled railways, I think they can run 8 rakes even in day time.

Q.—It would not interfere with the local traffic?

A.—Not much as local traffic will be interfered with between Grant Road and Marine Lines.

Q.—There is one more question I want to ask. House rents and shop rents are higher in the business parts of Bombay Fort than in London?

A.—We are told so.

Q.—You were in London?

A.—I was not told detail. I was told when in London that house rent is not dearer there than in Bombay.

Q.—Is there any ground then for suggesting provision of additional land?

A.—That was in 1920. I am not aware if the drop in London has been as great as we have had in Bombay between the years 1919 to 1926. We had land going on at Rs. 41 rent at Bombay Port Trust Ballard Estate. Now there is no land over Rs. 4.

Q.—Compared to London, rent in Calcutta is very much higher, and it does not require an expansion in Calcutta?

A.—We are in an island and Calcutta is not an island.

The Chairman.—You do not think if more space is available rents will go down and trade will improve?

A.—If you give too much land, trade will be affected adversely.

Q.—It is an undoubted fact that there is intense congestion in parts of the city as compared with other cities. Some tables have been given by people who are doing propaganda work. According to them, congestion in New York is much worse than in Bombay. Having regard to Indian conditions, there is probably more congestion in Bombay?

A.—Comparatively.

The witness then withdrew, and the Committee rose for the day.

The Committee assembled at 11 a.m. on Tuesday, the 24th August 1926, with Sir M. Visvesvaraya in the Chair

Sir Lawless Hepper and Messrs. Elgee, Harvey and Thomas were examined.

37th witness

Mr. T. Harvey, Superintending Engineer

Chairman.—Sir Lawless Hepper, I suppose these officers will give evidence along with you. There is no time for asking questions individually. The information we require from you to-day relates to estimates and technical questions connected with the control and conduct of the works. We shall also be glad to obtain explanations regarding the complaints brought before the committee. It is for you to decide in what manner you would like to meet the allegations made, whether by verbal explanations or in the shape of written statements. You have handed in a written statement which has come in only a few minutes ago. When any questions are asked you may refer to passages in that statement and also give any further verbal explanations that you may think necessary. Our sittings will be over to-day and I hope if we want any further information we can obtain it by personal interviews or during our inspection of the works.

Sir Frederick Hopkinson.—Sir Lawless, tenders were originally called for for the first 2,000 feet of the Colaba wall?

A.—Yes

Q.—Can you give me those tenders?

A.—We have already handed them in to the Secretary. (The Secretary explained that all the items, except two of the items of information he promised, were received from Sir Lawless Hepper.)

Q.—Do you know of your own knowledge why none of these tenders was accepted?

A.—I have no knowledge except from the report which Sir George Buchanan submitted. The tenders were referred to him, and he for certain reasons stated in the report did not recommend that any of them should be accepted.

Q.—My recollection is that what he has stated is that it is not advisable to accept any of them.

A.—I think he said that no contractors had been able to put up suitable proposals and it was advisable that the work should be done departmentally. I don't think he gave any detailed reasons for it but he made that report. I have no information myself.

Mr. Billimoria.—Has Sir George Buchanan in his correspondence complained that instead of giving it over to the contractors it has been carried on departmentally; he has been in favour of contractors being employed and not of departmental work?

A. -In his report he recommends that the dredging should in any case be done departmentally. But as regards the sea wall, he suggests two alternatives, either doing it departmentally or doing it by contract; and he suggests that the method of doing it by contract should be decided by calling for tenders; and when tenders were called for for the first 2,000 feet, he recommended to Government that the tenders should not be accepted and the work should be done departmentally.

Sir Frederick Hopkinson.—Did you see the tenders that were invited?

A.—I did not.

Q.—I believe the tenders were called for large concrete blocks to form the entire wall. You have given me a list of plant. Now, have you got a large number of 25 or 30 ton wagons?

A.—We have 150 open wagons of normal design which are at present hired to the G. I. P. Railway. They were not ordered for the reclamation scheme. In connection with the industrial housing scheme of 50,000 tenements there was very great difficulty in obtaining the material, shingle and sand which had to come 30 miles away from Bombay, and the railways could not guarantee the necessary tonnage. These wagons were accordingly purchased and hired to the G. I. P. Railway on the usual Indian Railway Conference terms and as a result the Railway guaranteed the required tonnage.

Q.—These wagons I presume could be available for the reclamation?

A.—They are available: the G. I. P. have offered to buy them, but I have asked them to continue the hire terms until November, in order that if the Government wished to transfer them to the Back Bay Reclamation we should be in a position to do so.

Q.—Are they 30 ton wagons?

A.—22 ton wagons.

Q.—Is that right, because I have heard that they are 30 ton and 25 ton wagons.

A.—They are new pattern standard state railway steel wagons; I think they are 22 tons.

Q.—I would ask you to advise the Government not to dispose of the wagons?
A.—Very well.

Q.—Similarly, I have seen an invitation for tenders for moorum filling of block 2.
A.—Yes.

Q.—I would also ask you to advise the Government not to accept any tenders sent in on that invitation.
A.—I will do so.

Q.—Mr. Nariman was here on Saturday, and he made certain definite charges against your department?
A.—He did.

Q.—I told him to indicate in the whole statement, the charges that should be answered during our present sittings. I propose therefore to go through the whole statement and I should like you to say whatever you have to say or your officers, in connexion with any of those charges made.
A.—My statement only deals with the Back Bay Reclamation and with the case of the steel bars although the steel bars had nothing to do with the Back Bay Reclamation.

Q.—I did not know at the time that the steel bars were not connected with the reclamation. We are not going to deal with anything outside the reclamation.
A.—My statement does not refer to his allegations in connexion with the chawl contracts.

Q.—Perhaps, as he has made these definite charges about steel bars, it may be advisable that your answers should be just as publicly given.
A.—I should be glad.

(I ask you, gentlemen of the Press, that as Mr. Nariman's statement is given the widest publicity you should give at least equal publicity to the answers.)
Q.—I am only going to ask you questions about definite statements. General statements I do not propose to deal with. Is Mr. Nariman what is known here as a pleader?
A.—He is.

Q.—And as such is it part of his professional life to defend criminals in a police court?
A.—I think it is.

Q.—Some of these charges are so extraordinary that I venture to suggest that possibly his point of view has been somewhat coloured by his professional activities in defending criminals?
A.—I think it probably is so.

Q.—In the last paragraph on page 14-A, he says that we must " investigate as to how and through whom the final transaction took place between Military and the Government ". As far as I remember his accusation, it was that you were in some way an interested party between the Ministry of Munitions and the Government of Bombay. Can you tell us how the sale was made?
A.—The sale was made direct between the Government of India and the Government of Bombay.

Q.—Had you anything to do with that?
A.—I have explained that in my statement; it is at bottom of page 3. In paragraph 34 of his statement, page 14-A of the typed copy, Mr. Nariman says " Had Sir Lawless Hepper anything to do as head of the Ministry of Munitions "? This is an insinuation in which I think he has allowed himself to indulge on former occasions. The facts are these: The Munitions Board was appointed by the Government of India and formed part of the Central Government. Local Circles under a controller of Munitions were formed in Calcutta, Bombay and Karachi. I was asked by Sir Thomas Holland, President of the Munitions Board, if I would take up the appointment of Controller of Munitions, Bombay Circle, in addition to my duties as Agent of the G. I. P. Railway. I did so and acted in that capacity for 18 months, my principal work being to organise the transhipment of military stores and munitions between the railways and the shipping department in regard to which there had been at first some confusion leading to serious detentions to rolling stock. The sale of the " Kalu " was effected by the Government of India, whether by the Munitions Board or not I am unable to say; in any case I had nothing whatever to do with it, and was not aware of the transaction until after I became Director in November 1920.

Q.—That dispels at any rate your personal connexion?
A.—Yes.

Q.—Turning to page 17, he says, " when allegations are openly made all parties concerned would naturally take all the necessary steps and precautions to destroy all the valuable materials in the shape of documents and private records that would in case of an immediate investigation, throw light on the subject."

Do you think you and your principal officers would naturally take all the necessary steps to do that criminal act?

A.—We should certainly do nothing of the sort.

Q.—Is it the practice in Government departments to destroy such documents?

A.—I have never heard of it; I do not believe it is so.

Q.—Do you think it possible that Mr. Nariman had in his mind somebody whom he had to defend?

A.—It is more than likely.

Q.—In those circumstances, he may consider that all the Government employees were all of the same character?

A.—I think that corruption of that sort is probably more rife in the circles in which he moves and that he is inclined to think that the same thing may be done in the Government offices.

Mr. Billimoria.—You suggest that evidence of that nature would not be destroyed by any officer in Government departments?

A.—No; we have as a matter of fact submitted the whole of the original documents. In connexion with all these contracts and with the steel case, the whole of the documents are in those papers; there is not a single case referred to the original documents in connection with which have not already been submitted.

Sir Frederick Hopkinson.—What I propose to suggest to Government is that this committee is not competent to deal with criminal charges, that if the Government think these allegations by Mr. Nariman are of a sufficiently definite character, they would take up the matter through their legal advisers?

A.—Mr. Harvey, I understand, proposes to ask the Committee for a permission to prosecute Mr. Nariman, provided the Government will give the necessary permission to do so.

Q.—The strong wish of this Committee is that the truth should be brought out, at any cost, by any body?

Chairman.—About other matters, the Government can undertake them.

Mr. Billimoria.—I take it, Sir Lawless, that you will have no objection to Government instituting proper enquiries as to the charges levelled against your department, departmentally I mean?

A.—None whatever.

Q.—This Committee cannot go into that?

A.—These cases have already been enquired into by Government, and Government are satisfied that there is no foundation whatever for such allegations.

Sir Frederick Hopkinson.—Would you welcome any further enquiry that would go into these matters?

A.—Certainly.

Chairman.—Your reply referred to all the allegations made in Mr. Nariman's statements.

Sir Frederick Hopkinson.—We must take one at a time; I want to take each allegation and deal with it.

Q.—At the end of the same page 17, he says " I openly make a charge that there has been a serious maladministration of the public funds and there has been a serious wasting of public funds. There have been instances which I would go to the length of calling frauds and I make this charge on behalf of the public ".....We cannot deal with a general charge of that kind of serious maladministration, but I take it, if he brings any definite charge, the Government would be only too happy to investigate. Is that so, Mr. Harvey?

A.—*Mr. Harvey.*—I hope so, Sir.

Q.—On the top of page 18 he says " There are ugly rumours in the city and the whole of the Presidency that the higher staff of officers have been receiving secret commissions from manufacturers and that is the reason why in this instance the department has incurred a loss of 3 lakhs." Do you know of any one having received secret commissions?

A.—I do not.

Q.—Then it is merely a statement of Mr. Nariman repeating ugly rumours? I do not see how you can meet him.

A.—*Sir Lawless Hepper.*—Our difficulty has always been that these charges are of such a general nature that it is extraordinarily difficult to meet them. He made these charges in Council where he is privileged and he has been repeatedly asked to produce definite charges on which Government or I can form some opinion and start some enquiry and he has also been offered by Government a judicial enquiry. He has been told in that connection that it was not necessary for him to produce sufficient evidence to prove what he said, but that all that was necessary for him to do was to indicate the directions in which

the judicial enquiry should proceed. He has been told by Government that they will have an enquiry presided over by a judge. But he has absolutely declined to come forward and give any evidence before any enquiry of any sort or kind.

Q.—It is really rather in the nature of an anonymous letter?

A.—It is very much the same.

Q.—He says, " If you go to the Surplus Depôt, stores and plant worth 6 lakhs of rupees or more are lying undisposed of." What have you to say about that?

A.—*Mr. Harvey.*—We had a good deal of surplus stores which was due to the curtailment of the Housing Scheme, most of which has been disposed of now.

Q.—Has it been disposed of with heavy loss?

A.—No Sir. We reckoned in the project estimate for the scheme a credit of $33\frac{1}{3}$ per cent. of the original cost of plant. We have got up-to-date for the plant disposed of about 40 per cent. credit.

Q.—So there was considerable loss?

A.—The plant has done considerable duty.

Q.—It is only plant?

A.—Yes, it is principally plant.

Q.—I think he is referring to his favourite subject of surplus stores. He has indicated 6 lakhs worth of steel bars disposed of?

A.—There certainly was not 6 lakhs worth of steel bars there, but taking the plant and the steel bars together there possibly was.

Q.—It is largely the plant that has fulfilled its purpose that is disposed of?

A.—Yes.

Q.—Was it no good keeping it?

A.—It is no good keeping it as no further work has to be carried on.

Q.—Therefore it was a proper businesslike thing to dispose of it?

A.—Yes.

Q.—It is due to the curtailment of programme?

A.—It was.

Q.—Will you please tell us, Sir Lawless, one thing? He says that an indent was intentionally altered. Mr. Nariman has written a letter to ask whether we would not allow him to discuss these things on the ground that they did not come within the terms of reference. If these steel bars were not required for the Back Bay Reclamation we won't go into it at all?

A.—*Sir Lawless Hepper.*—This is the only case in which he is making any definite allegation.

Q.—It does not refer to Back Bay Scheme at all?

A.—This is his favourite allegation. It is the one in which he committed himself to a definite allegation.

Mr. Billimoria.—If you made a general denial that the steel bars had nothing whatever to do with Back Bay Reclamation it can serve our purpose. You can issue a memorandum and refute the charges he makes.

Sir Frederick Hopkinson.—What were the bars required for?

A.—For piles for chawls.

Q.—He is dealing with the whole of the bars. I think it would be irregular for us to go into the matter?

A.—*Mr. Harvey.*—He had his say the other day.

Sir M. Visvesvaraya.—We thought the purchases referred to the Back Bay Scheme. It is quite true that he went into the matter.

A.—*Mr. Harvey.*—He must have known definitely that it did not belong to the Back Bay Scheme. He knew that he was going into the Housing Scheme.

Sir Frederick Hopkinson.—Personally, I should prefer to have the allegations answered.

A.—*Sir Lawless Hepper.*—I should revert to his oral evidence. The question was " I only say it may have been a mistake "? He says, " I say it is an intentional alteration ". Then he was asked, " Why should a man make such an intentional mistake "? His reply was, " In order that the manufacturers might be profited. There is no other explanation that I could see ". He was then asked by Mr. Billimoria, " Do you suggest that there was an ulterior motive? A.—Yes ". He was then asked again by Mr. Billimoria coming to the question of favouring a particular contractor, " Do you also suggest any ulterior motive here? The witness replied in the affirmative " My submission is that, Mr. Nariman having been allowed to express these views and to make these definite charges before this Committee, it is only fair that the officers of the Directorate should be given an opportunity of conclusively refuting his statements.

Q.—If any one of these bars has been used in the reclamation work I think we can properly listen to your explanation.

A.—*Mr. Harvey.*—I think some of these bars have been passed on to the reclamation

Q.—Only one will do?

A.—*Sir Lawless Hepper.*—You have got it in writing and also by Mr. Harvey.

Sir Frederick Hopkinson.—I want this to go on the notes so that I can find it in the future.

A.—*Mr. Harvey.*—I have not seen that complete statement.

Q.—Will you explain to us how this indent was altered by the Superintending Engineer?

A.—*Sir Lawless Hepper.*—The indent was originally submitted by the Executive Engineer who inadvertently omitted to enter in it the steel bars required for the piles, and this mistake was discovered in the Superintending Engineer's Office.

Q.—He did not put them in at all?

A.—No. This omission was discovered and orders were given in consultation with the Executive Engineer that the necessary addition should be made to the indent.

Q.—That is not an alteration. That is a supplementary indent.

A.—It had been apparently intended to use 5/8″ bars.

Q.—That did not appear in the indent.

A.—Not in the original indent. The piles had been designed to be made with 5/8″ bars, but by some mistake, either of a draftsman or a Supervisor, 7/8″ was entered instead of 5/8″. It has not been possible to prove who made the mistake, but the Superintending Engineer has always accepted responsibility for the error, because it was made in his office. After the bars had been ordered the mistake was discovered and an attempt was made to stop the supply, but it was too late. It was then decided to redesign the piles making use of 7/8″ bars instead of 5/8″ and that was done, and the 7/8″ bars were used up without any loss to Government and without any effect on the stability of the buildings. Another point is about the Surplus Stores. That there was a surplus of steel bars does not affect the question. The surplus was due to the curtailment of the housing scheme. It was a question of tonnage. The original programme was to build 50,000 tenements in eight years commencing with a small number of chawls the first year, and as the organisation improved, it was proposed to increase the number of chawls to be put in hand annually. The steel bars were arranged for through the High Commissioner, because Messrs. Tata who make steel informed us that they were unable to supply as they were engaged on other works, and the indent had therefore to be sent Home about nine months before delivery could be effected in India, and when the programme was suddenly curtailed from 50,000 to 16,000 tenements the steel supply for that particular year had just arrived and it was inevitable that there should be a surplus. But it was not due in any way to the alteration of 5/8″ to 7/8″. That matter did not affect the surplus at all and there was no loss whatever to Government on account of the change of size.

Q.—I suppose the reduction in the number of chawls is due to circumstances.

A.—It was due to the fact that as these chawls were completed and placed on the market it became evident that there was less demand for the tenements than had been expected. The Government decided that having in view that the population had probably decreased owing to trade depression, the programme should be stopped at 16,000.

Q.—Is there any difficulty in altering the design of the piles in order that the 7/8″ may be used?

A.—I should like Mr. Harvey to deal with it in detail.

Q.—Is Mr. Harvey an Engineer?

A.—*Mr. Harvey.*—I am the Superintending Engineer against whom these allegations have been brought.

Q.—Is there any difficulty in altering the design of the piles without increasing the total weight of the steel per cubic foot?

A.—Not only were the piles altered but the columns and compression bars of beams and so on. I consider not.

Q.—It is, in fact, the ordinary common sense thing to do?

A.—How we could do we did it in the best way as far as steel was concerned. We reduced the cement by 10 per cent. It reduces the strength of the concrete to a certain extent but that was compensated for by the extra strength of steel.

Q.—The net result was that the total cost of the Government was no more.

A.—If you work on that basis, no.

Mr. Billimoria.—The allegation made by Mr. Nariman is that the figure 5/8″ was altered to 7/8″. That is, in the reply you say it was a mistake.

A.—An addition was made. I have got the figure. The original document is here.

Q.—That does not mean an alteration.

A.—There was no alteration. It was an addition.

Sir M. Visvesvaraya.—The Executive Engineer has got that here.

A.—The Executive Engineer forgot the bars for piles and I talked to him about the ordering of these bars and he said that he had forgotten all about it. I asked him then to work out the number of bars required and to let me know, as the indent had got to go to the Secretary of State. This figure was 80,000 altogether. This was divided into two: one for the local indent for steel that was to be supplied immediately and the other, 50,000 bars, was included in the indent of the Secretary of State.

Sir Frederick Hopkinson.—Shortly, now, if the indent can be shown not to have been altered, then Mr. Nariman's allegation is false.

A.—It is absolutely false.

Q.—He can see that indent at any time he likes.

A.—Yes.

Q.—You agree with me, that a man who never makes any mistake never makes any thing?

A.—I agree.

Q.—I am bound to say that Mr. Nariman is sanctimonious. He says, " I can place before the committee all the materials that I have been able to collect not with a view or desire to cast any aspersion against any individuals of the department but primarily to enable an independent investigation to find out the truth ". Would you take that as accurate?

A.—*Sir Lawless Hepper.*—His great desire is to damn the Government.

Q.—Not to ascertain the truth?

A.—I don't think he cared whatever whether it was the truth or not.

Q.—Then he goes on somewhere to say about the officers having left the service.

A.—May I before finishing this question of steel bars refer to the answers to his questions in Council which I have attached to my statement, because it seems to be rather important to show that he was given very clearly the whole story about the steel bars? In spite of that he makes these allegations again. I have attached copies of questions and answers to my statement. He knew perfectly well what the facts were.

Q.—I want every word of this.

A.—*Mr. Harvey.*—Before this question is finished may I make a request? Well, Sir, you have had the allegations that Mr. Nariman has made against me. You have the statement of fact in front of you of what has actually happened and you can judge best as to whether he was justified in making these allegations or not. My legal advisers state that these allegations are malicious and as such are calculated to damage my career. I must therefore take a very serious view of the case and I request that I may be permitted by the members of this Committee subject to the sanction of the Local Government to prosecute Mr. Nariman for defamation.

Mr. Billimoria.—It is beyond the scope of this Committee. That is a domestic affair between you and Mr. Nariman. This Committee cannot give you any directions.

A.—I may take it that he is not protected in any way by the Committee.

Sir Frederick Hopkinson.—We have nothing to do with it. If you wish to prosecute Mr. Nariman you can by any means do it.

Sir Lawless Hepper.—I was not sure whether what he said was privileged or protected. In his oral evidence which was reported in the press, Mr. Nariman appears to have gone further than in his written statement. He is reported to have stated—

(*a*) that the alteration from 5/8″ to 7/8″ was made intentionally by the Superintending Engineer in order that the manufacturers might be benefited.

(*b*) in regard to the favouring of a particular contractor there was an ulterior motive.

(*c*) Resulting in a loss of 2,50,000.

I submit for the consideration of the Committee that in view of the explanation already given to Mr. Nariman in Council these allegations are clearly malicious and that no privilege or protection should be accorded in respect of them.

Sir Frederick Hopkinson.—Unfortunately our Chairman is not here. He said the other day that anything given here was protected unless it is malicious, in which case there was no protection here for malicious or defamatory statements.

Q.—In the middle of page 17 he says, " it is now nearly 2 years since that resolution was passed when these allegations were made and most of the Officers concerned have left the Service ". What Officers have left the Service?

A.—We had a separate Superintending Engineer in charge of the suburban schemes.

Q.—Of Back Bay.

A.—*Mr. Harvey.*—One officer has left. Mr. Billinton who was in charge of the construction of the sea-wall at Colaba. Most of his previous allegations were in connection with the Housing Scheme and it is not the officers who left the service of the Department within the past 2 years that were responsible but the officers who left immediately before be made those allegations that were responsible for them, to my mind, some of them.

Mr. Billimoria.—Have you any explanation with regard to Mr. Billinton's leaving the office, Sir Lawless? If that concerned the Back Bay you had better go into that.

A.—*Sir Lawless Hepper.*—He left the service, because the construction of the sea-wall at Colaba, of which he was in charge, was completed, and we were not justified in continuing his service.

Q.—Where is he now?

A.—He is now employed as an officer in the Madras and Southern Mahratta Railway.

Sir Frederick Hopkinson.—Now we come to Mr. Balkishan. He has made very definite allegations that you have paid as much as Rs. 10 a truck for unloading moorum which was subsequently reduced I think to Rs. 2½ per truck. What explanation have you about that?

A.—Mr. Elgee, the Chief Engineer, Reclamation Branch, has submitted a full explanation at page 2.

Q.—I understand, Mr. Elgee, that you have gone into the matter and you say you could find no evidence of it regarding the allegations of Mr. Husseinbhoy. Mr. Nariman goes further than that. He says the rate of Rs. 10 was paid while the actual present rate is Rs. 2-8-0.

A.—That is explained in my statement at page 2. The original rate was Rs. 2½ per brass which is equivalent to annas 10 and pies 10 per ton or Rs. 10 per 400 cubic feet.

Q.—Rs. 10 per truck is then true. What is the price of it now?

A.—It varies with the class of work done.

Q.—You say the original rate was Rs. 2/8 per brass. That is equivalent to Rs. 10 per wagon of 400 cubic feet. It is true then what Mr. Nariman said that you paid Rs. 10 per truck. What is the price to-day?

A.—*Mr. Elgee.*—It varies.

Q.—Can you tell us how it varies?

A.—I may be permitted to read from this written note. " I attach hereto a statement showing such works and the rates paid to the various contractors employed. It will be seen that the rates are identical. A reference has been given to the number and date of the contract in each case so that the particular contract can be traced in the contract files submitted herewith. The contracts with Balakishendas Seth have been flagged in these files for easy reference ". They are the actual contracts from the beginning of the works up to the present time. " A wide shallow area existed between the Marine Lines Colaba Railway and the foreshore at R.L. 91, the level to which the filling was to be carried out. It was not practicable to fill this area by dredging. It was therefore decided to fill this area by using spoil from the quarry as and when this was available." The original rate paid for this work.....

Q.—The original rate per wagon?

A.—All this information is given at the end of the statement.

" The original rate paid for this work which was intermittent and sandwiched in with other work already in progress was Rs. 2/8 per 100 cubic feet which is equivalent to Re. 0/10 per ton or Rs. 10 per wagon of 400 cubic feet. This rate was subsequently reduced to Rs. 6 per wagon of 100 cubic feet. I am now unable to give reasons for the original rate of Rs. 2/8 or for the reduction to Rs. 1/8. When earth filling by tipping and spreading from the cross bund or wall was taken in hand as an alternative means of employment for labour engaged for the storm water drains the rate given was annas 3/6 per ton. In this case the depth of filling was considerable and the lead was limited to 50 feet. This rate is equivalent to Rs. 4/6 for a 20 ton wagon."

Mr. Billimoria.—What was the interval between the rate of Rs. 10 and Rs. 6? Was it directly reduced or did it go on for some time?

A.—It was a test rate.

Sir Frederick Hopkinson.—They did not know what it was going to cost so they gave a test rate? Who did not know what it would cost?

A.—Mr. Lewis.

Q.—Mr. Lewis had no information at that time what it was going to cost? He had no experience of moorum filling?

A.—The point is that the supply of moorum was very irregular, and it was not only moorum that was to be sent down to Bombay but it was a question of obtaining spoil from the quarry. They did not know how many trains would be worked daily and the rate was fluctuating.

Q.—How did you mark that as a test rate? Is it necessary to have a test rate to unload moorum in a truck? Mr. Elgee, by your experience cannot you say what the rate should be?

A.—I think I know it pretty well what it ought to cost.

Q.—That was practically the rate for unloading for months?

A.—Of course it was not a very good arrangement.

Q.—Then it was altered almost at once.

A.—It went on for not more than a month and then it was reduced to six?

Q.—Who was responsible for that?

A.—Mr. Lewis who was during this time Chief Engineer.

Mr. Billimoria.—If it was running only for one month, the contractor could not have been profited considerably from that?

A.—Some days there were no trucks available and sometime there were very few so that he had a very small amount to get.

Sir Frederick Hopkinson.—Can you tell us the number of wagons so that we should know if there is any substance in the complaint? Can you give me any idea?

A.—There were not more than 200 trucks.

Q.—Therefore the total cost was about Rs. 2,000?

A.—Yes, about that.

Q.—Now the rate is Rs. 2/8 per truck. Can you tell us why it has come down to this figure?

A.—Because the work has now become steady.

Q.—It is altered in character?

A.—It is altered in character. At that time the work was confined to small area and with a long lead. When we had to utilise more moorum filling we decided to call for further tenders. These were tendered by 4 companies and the tender which was accepted was at the rate of 2 annas per ton with a lead of 100 feet, Re. 0/2/3 per ton with a lead of 200 feet and Re. 0/2/6 a ton with a lead of 300 feet. That is about Rs. 2/8 a wagon taking 100 feet lead.

Mr. Billimoria.—Did you invite any tenders when you gave a rate of Rs. 10?

A.—Not at that time because there was not sufficient work and it did not keep the contractor employed during the whole time. I can put in a letter from the Deputy Chief Engineer explaining the reason why the contracts were given on that rate.

Sir Frederick Hopkinson.—As I understand what you say is that the rate of Rs. 6 was paid for small and intermittent supply of material?

A.—That is so.

Q.—When you got a regular, steady and larger output you arranged it at Rs. 2-8-0.

A.—Yes.

Q.—From my experience, Mr. Elgee, I think I am justified in saying that nobody is going to make a big profit out of unloading moorum at Rs. 2-8-0 per truck?

A.—Yes.

Q.—It seems to me a very low price?

A.—It is. I have got the total amount at least that was paid to Balkishan Seth on the contract for unloading at Rs. 10 per wagon. The total amount paid at that rate was Rs. 3,080.

Q.—What year was that?

A.—It was in March 1924.

Sir M. Visvesvaraya.—Can you tell me how much money was paid to that contractor during the whole period he was working here?

A.—It was 9 lakhs.

Sir Frederick Hopkinson.—If he did that work at 2/8 per truck, I am quite satisfied that he did not make an unreasonable profit out of it?

A.—The contract was not confined to that, he had other contracts also.

Mr. Billimoria.—What time elapsed between 10 and 6. What year it was charged Rs. 10 and what year Rs. 6 and what year Rs. 2/8? The allegation made is that a very substantial profit was made by the contractor because you allowed him very high rates. Have you got anything to repudiate that allegation by any statement?

Sir Frederick Hopkinson.—What Mr. Billimoria means is how much work he did for Rs. 10 and for Rs. 6 as compared with Rs. 2/8. If the information is not ready you can send that?

A.—He did nothing at the rate of Rs. 2/8.

Q.—His tender was not accepted; was it higher than others?

A.—There were 3 tenders at the rate.

Q.—Which of these did you accept? No. 3 seems to be the lowest.

A.—It was not the lowest. When Balkrishna Seth's tender was received, the papers were sent to Government.

Q.—The tender accepted then was actually higher than No. 3 and the note you give is this? "Recommended for acceptance. Here is a contractor who is at present doing the work and has the necessary labour on the spot"?

A.—Yes.

Q.—Was he satisfactory? Did he do the work satisfactorily?
A.—Yes, he always did his work satisfactorily.

Q.—Did you know No. 3?
A.—We had no experience.

Q.—In your opinion was that the best tender in the circumstances that was accepted?
A.—Yes.

Q.—You are there, for the purpose of exercising your discretion as to which tender should be accepted?
A.—That is so.

Q.—You have to take responsibility?
A.—Yes.

Q.—And if you accept a tender from a man who is incapable of properly carrying it out, you are discredited for it?
A.—That is so.

Q.—Did you while accepting these tenders act in a fair and judicial manner as required by a man in your position?
A.—I did so.

Mr. Billimoria.—If the total amount of work done by this contractor amounted to 9 lakhs and the rate given to him was Rs. 6 per truck, which subsequently was for all the work, then he was working at a profit of 4 lakhs. Can you give us some particulars about that?

A.—I have submitted a complete list of all the contracts from start to finish and it is fully detailed at page 6 of my statement. The contracts with this contractor and the contracts with other contractors and the rates in each case are given for comparison.

Q.—In any case the difference between Rs. 6 and 2/8 would be an insignificantly small amount?

A.—It only refers to small amount that this contractor was doing.

Q.—He did not make profits of lakhs of rupees as alleged by Mr. Nariman?

A.—Certainly not. This contractor was doing other much more expensive kind of work and would not make any more money than in loading moorum.

Sir Frederick Hopkinson.—Mr. Nariman speaks of this contractor having been sentenced to a long term of imprisonment. Do you consider it a part of your duty to enquire into the private life of all the men who are employed on work?

A.—*Sir Lawless Hepper.*—I do not. My time is already sufficiently taken up to allow me to look into all these things.

Q.—Would you consider that a very spiteful and malicious remark made in a document that is going to be broadcasted to the public?

A.—Yes.

Q.—Was it brought to your notice that he had served long terms of imprisonment?

A.—I was absolutely unaware of that. I think he came with very good recommendation to Mr. Lewis as a contractor and I have submitted copies of the original recommendations. They are attached to the statement. It was 12 years ago that Mr. Balkrishna was convicted in the Punjab of fraud and sentenced to two years' imprisonment. But in the meantime he seems to have done a great deal to rehabilitate himself and lead an honest life and he came to us with very good certificates, one of which was from the Agent, Eastern Bengal Railway, a man, whom I have known for 30 years, and who would never give any man a certificate unless he knew that man well and thought him suitable for employment.

Q.—Can you imagine, Sir Lawless, a right thinking man making such statements to the public about a man who has been convicted 12 years before but has done a great deal to rehabilitate himself. Does not it seem to be a particularly mean and spiteful remark?

A.—It seems to be a very spiteful and mean remark but Mr. Nariman is not a right thinking man.

Q.—He says " this gentleman became a great favourite of all the officers from the highest to the lowest ". Was he a favourite of yours?

A.—He was not.

Q.—Did you know him?

A.—I saw him once or twice. He came to me after Government had given orders that he should no longer be employed, and he urged that he should not be hounded out because some of his competitors had discovered his previous history. I personally was rather inclined to that view, but it was considered more expedient not to employ him. I saw him on a subsequent occasion after he had been to Madras trying to get work there but some people in Bombay had written from Bombay to the engineers in Madras with the idea of preventing him from getting any work. He wanted to know whether anything

could be done and whether he could be given any sort of certificate to say that he was not blacklisted in Bombay on account of his having done bad work in Bombay. I told him as his services were being discontinued under the orders of Government, I was unable to do anything. I understand he subsequently saw the Honourable Member, with what result, I do not know.

Q.—If I had been in your position knowing the work he did, I would have given him a certificate. The man had after all served his imprisonment for the fraud he committed?

A.—I agree.

Q.—Can you tell me, Mr. Elgee, if this gentleman became a favourite of all the officers from the highest to the lowest?

A.—*Mr. Elgee.*—He was not a friend of mine; I can hardly call him that, he only met me on business matters.

Q.—On page 21 of his statement he says, " Mr. Thomas, Deputy Director of Development....." Was Mr. Thomas ever Deputy Director?

A.—No, Mr. Thomas is Executive Engineer, Projects. Mr. Mackie is the Deputy Director.

Q.—He says, " Mr. Thomas, Deputy Director, was in charge of harbour and other contracts and merchants were put out of the room when he opened the contract. The merchants protested and desired that the tenders should be opened in their presence but Mr. Thomas paid no heed and allowed only his favourite contractor Balkrishen Seth to remain in and to come in the room whenever desired whereas the other contractors were strictly kept out ". What is the usual procedure when tenders are called for by you?

A.—*Mr. Elgee.*—A box is placed in Mr. Thomas's office in which the sealed tenders are deposited. That box is locked; I have one set of keys which I keep in the safe and the other set is with Mr. Thomas. After the time, up to which tenders may be deposited, Mr. Thomas and I open the box and the tenders are brought to my office and opened by me personally. As I open each tender Mr. Thomas takes down the name of the contractor and also the amount of his tender in a rough statement. (Witness handed over a document and said) That is the original document on which Mr. Thomas had noted down the tenders as they were opened.

Q.—So from that you made up a list showing the 5 of the lowest tenders?

A.—These are my original markings.

Q.—So that they were each opened and marked by yourself personally?

A.—That is so.

Q.—You asked the least 5 tenderers you have noted down for interview?

A.—Yes.

Q.—And as a result of that interview you decided to accept a particular tender as you have already stated?

A.—Yes.

Q.—He says, " was anyone in the room when you opened these tenders "?

A.—No. Mr. Thomas and myself only.

Q.—Then " the merchants protested and desired that tenders should be opened in their presence "?

A.—I was very busy at the time and Mr. Thomas came in and told me that the contractors wanted to be present when the tenders are opened. But that was not the usual procedure for the contractors to be present. In the advertisement calling for tenders we never said that contractors will be present when the tenders will be opened and it was only on one occasion that contractors were invited to be present.

Mr. Billimoria.—It has been suggested that at the 11th hour practically this tender was put in and it was accepted? It was in answer to a question from me that Mr. Nariman said so.

A.—It is absolutely an untruth, because Balkrishan's tender was 5th from the bottom; it was not the least or near the least.

Q.—It is not possible to substitute any tender?

A.—Absolutely impossible.

Q.—The box is opened in the presence of the contractors so that he would put in the least tender or lower than the least?

A.—Unless he got hold of some magician or fortune teller.

Sir Frederick Hopkinson.—" That Balkrishan was secretly informed of the least rate "?

A.—That is absolutely untrue.

Q.—Was Balkrishan in the list of contractors and not allowed to put in tenders?

A.—Yes, afterwards, when Sir Lawless Hepper received instructions from the Government.

Q.—I do not think there is any rule binding the Chief Engineer to call for tenders?

A.—No.

Q.—Is it not your business to know the value and the proper prices to be got for such works, and if you do not know you do not know your business?

A.—Yes.

Q.—On page 29, he (Mr. Nariman) speaks about the agreement made with four cement companies giving contract whereby these companies are given the sole monopoly of supplying all the cement required up to 60,000 tons per annum?

A.—*Sir Lawless Hepper.*—At the time the work was taken in hand the rates of cement were very high; I think for imported cement the rate was about 140 a ton and for Indian Cement it was over 100 a ton. Government were very anxious at that time that as far as possible contracts for the supply of cement should be given to Indian manufacturers. At that time the quality of Indian Cement was rather irregular and it was thought desirable to enter into a long term contract and that very stringent arrangements should be made for testing the cement. Accordingly we called for tenders for a 10 years contract either on the basis of fixed price or on the basis of cost price plus a certain rate of profit. We received no tender at a fixed price, but we received several tenders on the basis of cost plus a percentage of profits, and the most favourable tender we received was from a group of four companies who undertook to supply cement up to the maximum limit of 60,000 tons a year for ten years at actual cost plus 15 per cent. profit, and the contract was made with them on that basis. The actual cost of cement was verified every year by an independent firm of auditors who certified the accuracy of the cost.

Q.—Would you consider the percentage of 15 per cent. high for cement companies in those times?

A.—We did not consider it to be so.

Q.—Yes, we know that prices of cement were higher from 1919.

A.—It was the case.

Q.—But you had to make yourself sure with regard to rates for carrying out the reclamation and development work?

A.—As I told you we had made ourselves sure about it.

Q.—It was essential that you should have a price fixed for the future contracts of cement otherwise you will have to pay up to 120 or 140 a ton, and do you think by that method you would have saved Government any money?

A.—I don't think we would have. In the first couple of years our prices which worked out at about Rs. 60 a ton were below the market price and then a trade slump came and prices of cement in the bazar went down very much indeed. They have now gone up again.

Sir M. Visvesvaraya.—But it is alleged that the period was too long?

A.—It was intended to cover the period of the construction of the chawls.

Mr. Billimoria.—Well, Sir Lawless, but when one of the companies who had contracted to supply cement every year expressed its inability to continue the terms of agreement, instead of taking advantage of that position why that agreement was deliberately transferred to some other company?

A.—It was transferred in accordance with the terms of the agreement with the four companies.

Sir Frederick Hopkinson.—Do you think the reclamation work would have been finished if Government would have put Mr. Nariman in charge of this whole scheme?

A.—I do not think it likely, Sir.

Mr. Billimoria.—Had you a herculean task to perform with the development work or it was a mere supervision work?

A.—Of course it was part of my work but I had a large staff.

Q.—You had not exclusively to devote your whole time and attention to the reclamation scheme?

A.—Most of my time was given to other schemes.

Sir Frederick Hopkinson.—Now looking at your report for the year ending March 1921 I see you have various duties enumerated from say 'A to H' in which the Back Bay Reclamation is described in two lines. Now as far as I understand you are the one controlling man in the Development Directorate?

A.—Yes.

Q.—You had a deputy but you are personally responsible for the whole thing?

A.—Not as regards the technical part of the reclamation scheme.

Q.—No, my question is as regards the Development you are the man who is in sole charge of the thing? And is it possible for one man to be in charge of a scheme to be completed within ten years and finish it within a stipulated time?

A.—It turned out to be a bigger thing than expected.

Q.—I am looking at it in 1920-21. Here is a big scheme don't you think that several men are required to be associated with it to control such a vast organisation?

A.—I do of course; a very large staff is required.

Sir Frederick Hopkinson.—I know that an enormous responsibility rested on one man's shoulders and he had to manage several other things besides the great thing.

Sir M. Visvesvaraya.—What was the total amount of estimates controlled by you?

A.—The Housing Scheme was 3½ crores and the expenditure in the suburbs I am not quite sure something like two crores.

Mr. Billimoria.—Is that all or some 30 crores which was the original intention of the development to be finished in 15 years?

A.—Well, that was the original idea in 1919.

Sir Frederick Hopkinson.—That was still a huge scheme and undertaking?

A.—But some part of it was to be done by the Municipality, the Port Trust and the Improvement Trust.

Q.—Now is there anything you wish to add to your evidence to-day that I have not touched?

Sir M. Visvesvaraya.—Any statement for the Press?

A.—No, Sir, I have nothing to add.

Sir Frederick Hopkinson.—Mr. Elgee, do you want to add anything?

A.—In the last paragraph of the statement I have dealt with the majority of allegations based by Mr. Nariman, but I have not touched a few of them as they seem to me to be mere bazaar gossip.

Q.—Mr. Nariman, that day was suggesting something in regard to certain consignments that came directly in the personal name of Sir George Lloyd whereon he was explained that the consignments might have been relevant to the dredger " Sir George Lloyd ", but he wanted to suggest something, I don't think there was any other way of doing it?

A.—It was presumably for purposes of identification that several consignments came marked for the dredger " Sir George Lloyd ". This story was I think invented by a well-known publicist, Mr. B. F. Bharucha, who considers it necessary to inform the public, about three times a week, of his opinion on any possible subject.

Mr. Billimoria.—When the other day I called at your office I mean at the office of the audit officer I found there was an item of Rs. 13,200 in connection with a roof over a slip way for which you are going to count only Rs. 513, but that estimate was never sanctioned? Was the estimate sanctioned?

A.—*Mr. Elgee.*—The estimate was sanctioned. What actually happened was that the roof was being erected and in the monsoon owing to a blow of wind it came down and after that I thought as the monsoon was not finished to keep the roof as it stood that is not to build a new one but the estimate was sanctioned.

Sir Frederick Hopkinson.—Well, Sir Lawless I would ask you one more question Mr. Nariman states in one of the instances that commission to the extent of 8,94,000 was paid to Messrs. Meik and Buchanan on one dredger alone? Is it true that the total commission paid them for all works comes out at about 6½ lacs?

A.—*Sir Lawless Hepper.*—I believe the actual figure is about 6,76,000.

Mr. Billimoria.—Mr. Elgee, in the course of your evidence the other day you stated something about Mr. Stileman and Sir Alexander Gibb, do you know what opinion Mr. Stileman expressed in regard to this scheme?

A.—*Mr. Elgee.*—I don't know anything.

Q.—Do you know that Mr. Stileman considered this scheme a hopeless failure?

A.—Not at all.

Q.—Do you know at any stage he was offered any appointment by the Government in regard to this reclamation scheme?

A.—I have never heard of it.

(*Sir Lawless Hepper.*—I have seen his name mentioned in documents, but as far as I know no offer was made to him.)

Q.—Did he ever apply for a job?

A.—*Sir Lawless Hepper.*—I don't think so. It was at the time that Mr. Lewis was appointed the names of certain other persons were mentioned in Sir George Buchanan's memorandum, but I don't know whether and what offers were made to anybody.

Q.—In the statement submitted by Mr. Lalji Naranji it is stated that the expenditure to the extent of Rs. 1,90,00,000 was incurred without the sanctioned estimate as required by the Public Works Department Code. What is the truth of that statement?

A.—I do no think the statement is correct.

Q.—The amount is exaggerated?

A.—So far as I know no work was undertaken without sanctioned estimates. The work was undertaken on the sanctioned estimate of Rs. 3,67,00,000 except the original order for the dredger " Kalu ".

Q.—When you exceed an estimate on any main head, do you obtain the sanction of Government?

A.—Oh, yes. The Audit Officer would bring it to the notice of Government at once if there were any excess, and Government would probably order a revision of the estimate. It would have to be explained why the main head was going to be exceeded.

Q.—Then he says, " The Finance Department, if proper enquiry is made, will be found to have allowed the expenditure to be incurred by a mere order of the then Governor of Bombay ".

A.—That is not within my knowledge. It is for the Finance Department, I think, to reply to that.

Q.—I think Mr. Elgee mentioned the other day and some of your notes also show the same result, that the prospects of the scheme have improved since the Advisory Committee made their second report. The second report made by the Advisory Committee was more unfavourable than it need have been.

A.—It was based on the results of the season 1924-25, and of course in the subsequent season the results have been better. But the Advisory Committee simply based its report on the actual figures available at the time.

Q.—Do you agree with the rates given by the Kay Committee, the rates for moorum filling and dredging, or have you any views of your own different from that?

A.—The Chief Engineer has submitted to the Committee the estimate for the completion of the scheme block by block, and he has adopted rates which differ somewhat from the rates of the Kay Committee, and I think that personally I would prefer to adopt the rates that the Chief Engineer has adopted.

Q.—What is the rate for moorum?

A.—Rs. 1·57 per cubic yard.

Q.—Dredging from the harbour?

A.—Rs. 0·64 per cubic yard.

Q.—Dredging from Back Bay?

A.—Rs. 0·88. These are Mr. Elgee's rates.

Q.—The Kay Committee rely on the Neilson Committee figures. Your rates are much more favourable than those given by the Neilson Committee.

A.—As regards dredging they are.

Q.—In what other respects do you differ from the Neilson Committee's recommendations as regards the rates and quantities? Do you agree to the shrinkage allowance given by them?

A.—No, we think that the allowance of 40 per cent. for shrinkage in the case of the harbour filling is excessive, and we also think that the allowance of 30 per cent. for shrinkage of the material dredged from Back Bay is even more excessive.

Q.—Do they suggest 30 per cent. for Back Bay dredging?

A.—Yes.

Q.—It means a tremendous increase in cost.

A.—Yes.

Q.—The other day Mr. Neilson said that this is not a dredging proposition at all. Assuming it was not one, what do you think would have been the cost of reclamation if it was treated as a moorum filling proposition from the very commencement, very roughly.

A.—I am afraid it is rather difficult to give it.

Q.—It is 28 million cubic feet and you have Rs. 1/8 per cubic yard.

A.—The filling would be 370 lakhs, but there is all the rest of the work.

Q.—You do not want such a strong sea wall?

A.—I think you would have to have the same sea wall.

Q.—And cross bunds also?

A.—That might be simpler.

Q.—You may add about Rs. 50 lakhs or Rs. 70 lakhs for the sea wall.

A.—The cost of the sea wall is about Rs. 78 lakhs. I think the total cost would come to something over 11 crores.

Q.—I am afraid there is some mistake.

A.—We have already submitted an estimate for completing the whole reclamation with filling at 19 annas and that came to 11 crores.

Q.—Actual filling comes to Rs. 3,60,00,000, and then after that you want to add for sea wall.

A.—We have already spent a million sterling on plant.

Q.—My question is, leaving that out if you had started from the beginning with a clean slate and had a moorum filling proposition only and no dredging was intended, what would it have cost?

A.—I am afraid I cannot give it even roughly.

Q.—If the work is organised properly and the Railway Companies are also asked to co-operate you would be able to reduce the rate from Rs. 1/8?

A.—The Railways have promised they would give a slight reduction in rate if the number of trains is increased.

Q.—The moorum quarries may be nearer than Kandivli?

A.—I do not think they could be substantially nearer. I think the average distance would be about the same. Some might be a little nearer, some a little farther.

Sir Frederick Hopkinson.—Supposing the Committee suggests more moorum filling, can you give me an idea what the railway rate is likely to be for moorum in large quantities from both the present site and from future sites that may be discovered?

A.—It is Rs. 275 per train for two trains a day. They are going to charge Rs. 250 for 4 trains a day, and Rs. 225 for 6 trains a day. We have never gone beyond 6 trains.

Q.—Supposing you go up to 8?

A.—It may come down to Rs. 200. We have not discussed that, but of course the full load pays them well, and if the proposition was put to them that it is not likely that this dry filling will be taken up unless the rate is a favourable one they might reduce it. Up-to-date the railways have only been able to run our trains at certain hours.

Q.—I gather from all that has been said that the probability in future is the trains may run by day, and whilst on that point I should like to express my view to Government they should at once start investigating in the whole of the district for an adequate supply of moorum. They should not mind spending a few thousand rupees on it. It is money well spent and they must see not only in hills but in valleys below the ordinary ground. You may possibly in some of these get a face from 20 to 30 feet, which is very important.

Witness.—This is with a view to filling the whole reclamation?

Sir F. Hopkinson.—No, with a view to increase the moorum filling.

Q.—Can you explain precisely which of the blocks you can fill from the harbour and which from the Back Bay?

A.—You can fill blocks 8, 7, 6, 5, and part of 4, three-quarters roughly of 4 from the harbour.

Q.—Won't the output be very poor in 4 on account of distance?

A.—On account of the length of the pipe line it might. I do not know that it would affect it very greatly from our experience at the present time.

Q.—And in the rest of the blocks?

A.—Blocks 1 and 2 would be filled from Back Bay and Block 3 probably by dry filling entirely.

Q.—If the dredger had proved satisfactory would the 702 lakhs estimate have been exceeded?

A.—The 702 lakhs estimate would not have been exceeded provided the whole of the filling could have been obtained from the harbour and provided the output of the dredger had been 5 million cubic yards of consolidated filling per annum

Q.—On that estimate it looks as if there had been a saving of something like 30 lakhs of rupees?

A.—Under all other heads except on the dredged filling. There is an excess on plant of 28 lakhs owing to the dredging in the Back Bay.

Q.—You realise my point about what you call the project estimate. They are made generally by the man who is going to do the work, and therefore are not of very real value. Government require an estimate because they want to know what the work is going to cost. Mr. Elgee very fairly answered that if he was making a project estimate he would make the project estimate high enough?

A.—Well, there is a tendency naturally.

Q.—Nobody is going to blame anybody for making a saving out of an estimate?

A.—It is only when there is an excess.

Q.—It was alleged there was no specification for the sea wall. What is the truth about it?

A.—There was no specification. There was nothing except what is contained in Sir George Buchanan's report.

Q.—Why was the question of a guarantee omitted from the agreement with the manufacturers of the dredgers?

A.—I cannot say. They were ordered by the High Commissioner under the advice of the Consulting Naval Architect.

Q.—You said some calculations had been made for bringing material by barges. Have you been able to get it?

A.—I think that was done at an earlier stage. We did not do that.

Q.—The "Kalu" was first purchased for the East Colaba reclamation and it was transferred to this work?

A.—Yes. It was transferred to Back Bay.

Q.—Was it transferred because it was not required on that work or it was required here?

A.—The East Colaba reclamation scheme was closed down and then, owing to the restriction of the area in the harbour, it was decided to dredge in Back Bay, and naturally the " Kalu " was used for that purpose.

Q.—Was ever a project estimate for East Colaba made?

A.—Yes.

Q.—Have you got that? We know singularly little about that. I personally have not seen a project estimate and know hardly anything about it. The " Kalu " was bought specially to do it?

A.—I think so.

Q.—If you can give us any information about that East Colaba, I shall be obliged?

A.—I think Sir George Buchanan was asked to report on the Back Bay reclamation scheme and also on the East Colaba scheme.

Q.—I think he does not mention East Colaba in the report. Is there any separate report from him?

A.—I am not quite sure about that. There is a separate project estimate.

Q.—Will you have that looked up?

A.—Yes.

(*Sir Frederick Hopkinson.*—There is a project estimate. Let us have a copy of it and anything in connection with that reclamation scheme.)

Q.—It is said that the rates are Re. 1 and annas 10 for a male and a female cooly respectively and the rates have remained high in the Development Department. Is that correct?

A.—Yes.

Q.—Is not that about the average rate?

A.—We pay one rupee and nine annas.

Q.—What was the rate in 1920-21?

A.—It was much the same when I started. Since 1921 it has not practically moved.

Q.—Do you know what they were in 1913-14?

A.—That I cannot tell.

Q.—Can you get it for me?

(*Sir M. Visvesvaraya.*—Probably the Labour Office can give it.)

Q.—You have stated here " Kalu " was purchased in November 1919. That is about eight months before the scheme was sanctioned. It was purchased for the East Colaba Scheme, was it not?

A.—Yes.

Q.—I do not see why the capital account should be charged to Back Bay Reclamation if it was bought for the East Colaba. Don't you think that is a credit to Back Bay?

A.—It must be charged to something.

Mr. Billimoria.—But she has been used now in the Back Bay. Of course it will be a capital charge.

Sir Frederick Hopkinson.—That is the plan on which tenders were asked, and Mr. Walchand told us yesterday he was invited and spent thousands of rupees in making up a tender. This is very much more expensive and therefore you could not compare a tender based on this drawing with an estimate made on what you actually did.

Sir M. Visvesvaraya.—The tenders were called for without specification?

A.—For that 2,000 feet of wall there was.

Q.—What would be the final estimate now if the work is to be completed?

A.—Ten crores.

Q.—Have you increased the provision for the development part of the work?

A.—No. The provision for development remains the same. It was a very liberal provision made, and the Neilson Committee also adopted it.

Q.—Are there any prospects of reduction if the dredgers work satisfactorily, on the rates you have given?

A.—There may be a slight reduction.

Q.—You have not deducted the value of plant?

A.—No, I have not.

Q.—And the Kay Committee put down the value of plant at Rs. 25 lakhs only. Are you satisfied with that estimate?

A.—I think it is a safe figure to adopt. I would not put too high a value on the plant. It is on the safe side.

Q.—You have stated that there are mistakes in one or two of your statements.

A.—I am not sure whether they are important. I would like to refer very briefly to them, if I may. In my first day's evidence reading my evidence it looked to me that I have given the impression that I was anxious about the dredging in 1924, after we knew that the first season's dredging had been unsatisfactory, because the clay which had been dredged was of the description in Mr. Kidd's report. That is not correct, because I did not really study Mr. Kidd's report until late in 1925. Why I was anxious was because the material seemed to be stiff and the Engineers seemed to think that it was harder material than the dredger had been specified to deal with. It was only later on during the season 1925-26 that I looked up Mr. Kidd's report to see if there was anything in it which might have misled Sir George Buchanan as to the class of material.

(*Sir Frederick Hopkinson.*—Sir George Buchanan gave his own description?

A.—I do not know.

Q.—It certainly is not in Mr. Kidd's report.)

Another point is in regard to Sir George Buchanan's proposal to commence building the sea wall, to begin the sea wall from both ends I see I corrected that on a subsequent days' evidence. It was not Sir George Buchanan's proposal. It was the proposal of Government. I think I gave the Committee to understand that at the time that Sir George Buchanan was asked to begin the wall at both ends, before that, it was the intention to begin at Colaba. But I have seen on looking through the report of Sir George Buchanan on those tenders that it apparently was the intention prior to that time to commence at Marine Lines only. The original idea of Sir George Buchanan was to begin at Colaba. Then apparently in consultation with Government it was decided to begin at Marine Lines, and subsequently he was asked to begin at both ends. That was not out of my personal knowledge, but I gather it from a perusal of the report of Sir George Buchanan on the tenders for the sea wall at Colaba which the Committee have a copy of.

And then, the question is printed in my statement, " Then you estimated, at a very moderate estimate, the financial yield of this undertaking would be 30 crores " and in the answer I was put down as having said, " Yes." Either the question was wrong or my answer was wrong. I never estimated there would be a profit of 30 crores. As a matter of fact I was very much taken aback when I heard Sir Chimanlal Setalvad mention this figure, and I tried unsuccessfully to correct him.

As regards the question as to information regarding the financial prospects of the scheme not having been dealt with in my reports of 1924 and 1925, I am not sure if I made myself quite explicit. I wanted to explain that as an executive officer I did not feel that I could not take the responsibility of informing the public of details of the financial prospects of the reclamation scheme in terms which must at once call in question the policy of Government in regard to it. But when saying that, I did not wish to dissociate myself in any way from the action that Government took. I thought that Government were perfectly right and prudent in 1924 in not disclosing the results of the first season, and as regards the second season I think it was the best plan to allow the information to be available to the public by the Advisory Committee's report, seeing that that report was coming out. In this connection I should also like to refer to Rule 20 of the Government Servants' Conduct Rules, which is as follows :—" A Government servant may not publish in his own name.

(*a*) any statement of fact or opinion which may embarrass the relations between Government and the people of India or any sections of the people. A Government servant who intends to publish a statement which may be considered to fall within this rule shall submit a proof thereof and shall obtain the permission of Government before publication ".

I think if Government have the information, it is for them to give instructions or to issue the information themselves.

Q.—I think the executive officer ought to tell the Government that in his opinion this information ought to be published. You ought to make whatever reports you like to the Government. It is for the Government to say what they will publish.

A.—It is a question of opinion and Government procedure. An executive officer, I do not think, is usually intended to do that.

Q.—Then the question would arise whether you drew the attention of Government under the provisions of that section.

A.—I did not propose to Government that I should deal with this matter in my report.

Q.—Supposing you report to Government a certain thing and the Government say it is inadvisable to publish it, would you put your name to it if the Government were altering it in a way to mislead the public?

Sir M. Visvesvaraya.—How did the members of Government who made the alleged misleading statements get their information, Sir Chimanlal Setalvad for instance?

A.—Without knowing exactly what statements are referred to it is rather difficult to say. I think Sir Chimanlal Setalvad's only source of information could have been the Bombay Government's letter of the 4th December 1919. He spoke in 1921. There is

nothing that I have been able to find from which he could have got his figures except the letter of the Government in December 1919.

Mr. Billimoria.—It has been rumoured that some contracts were given to a Chinaman, Ah Wee. Do you know anything about that?

A.—He was employed I understand at driving piles for the gantry at Marine Lines.

Q.—Mr. Ah Wee was a contractor?

A.—*Mr. Elgee.*—Yes.

Q.—Was he brought by Sir George Buchanan?

A.—He was here when I came to Bombay first of all, and no contract had been made with him. He had been employed on building construction.

Q.—Did you employ him?

A.—I did.

Q.—Was he employed before you employed him?

A.—I do not know. He was not employed on reclamation.

Q.—The rumour is that he was specially put in charge of the construction of the wall by Sir George Buchanan. Is it not correct?

A.—As far as I know it is not true.

Q.—Has he made a lot of money?

A.—I am not acquainted with the bank accounts of different contractors.

Written statement put in by Sir Lawless Hepper on behalf of Development Directorate

The following statement deals with certain allegations against the Development Directorate contained in a written statement submitted by Mr. K. F. Nariman to the Back Bay Enquiry Committee. The paragraphs in Mr. Nariman's statement have been numbered for ease of reference.

2. In paragraphs 13-16 (pages 5 and 6 of the typed statement) it is alleged that paragraphs 10 and 11 of the first *ad interim* report of the Advisory Committee dated the 17th February 1925 contain "a deliberately false statement, intended to mislead the public and Council with the object of hushing up the bungle."

3. I would in the first place invite a reference to paragraph 6 of that report. It is there stated, that for the reasons given, the Chief Engineer, Reclamation Branch, had prepared a revised estimate amounting to Rs. 712·79 lakhs, and it is added "The Committee understand that the revised estimate cannot be regarded as final until the close of the present working season, as it is necessary to verify the cost of pumping from actual figures, which will not be available until after the season's work has been measured up." It will be remembered that the result of the dredging in the first season 1923-24 had been very unsatisfactory, but Government had agreed, on the suggestion of Sir George Buchanan, that no conclusions should be drawn until after the results of the first full season's pumping 1924-25, were known.

4. In paragraph 10 of their report the Committee express the opinion that the work should be proceeded with unless it can be established that there are serious grounds for believing—

(*a*) That the scheme is unsound from an engineering point of view, or

(*b*) That it is likely to result in an ultimate financial loss greater than that which would be entailed by closing it down.

5. In regard to (*a*) the Committee state "As regards the first point, the work has proceeded smoothly according to programme, and its stability has been tested by several monsoons. Whatever apprehensions, therefore, the public may have had on this score, the Committee see no reason to suppose that the project cannot be successfully completed." This had reference mainly to the sea wall, in regard to which criticisms had appeared in the press suggesting doubts as to its ability to withstand the monsoon.

6. As to (*b*) the Committee state "In regard to the possibility of financial loss, the expenditure has, up to date, approximated closely with the forecast, the total including interest charges, to 31st March 1924, being Rs. 412·39 lakhs, against the forecast figure of 421·16 lakhs." At that time (February 1925) neither I nor Government considered that there was sufficient experience of the dredging to justify final conclusions being drawn; and there was certainly no evidence of a nature to enable the Committee to form an opinion on their second alternative (*b*), *viz.*, whether the scheme was likely to result in an ultimate financial loss greater than that which would be entailed by closing it down.

7. At the end of paragraph 11 of their report the Committee announce their intention to appoint a sub-committee to examine the financial prospects of the scheme in detail and recommend that in the meantime work should be proceeded with.

8. It will be seen that the main point on which the Committee desired to form an opinion was whether the scheme was likely to result in an ultimate financial loss greater than that which would be entailed by closing it down. They had at the time no sufficient data on which to base conclusions, and accordingly appointed a sub-committee which, when the dredging results of the season 1924-25 were available, submitted a report recommending that blocks 1, 2 and 8 should be proceeded with, but forecasting a loss on the scheme; their figures being in substantial agreement with those contained in the report of Mr. Kay's Committee which has recently been submitted.

9. The report must be read as a whole, and not judged by isolated statements divorced from the context. It contains in paragraph 6 a definite indication that the cost of the scheme must depend on the cost of pumping, which was to be ascertained from the actual figures available after the close of the season 1924-25, and beyond that *merely* indicates that the Committee did not consider they had sufficient material before them to form conclusions and could not express an opinion until the actual figures were available and had been examined by their sub-committee.

10. To call this report " a deliberately false statement intended to mislead the public and Council with the object of hushing up the bungle " is a misuse of language. It is a fair sample of the campaign of calumny which Mr. Nariman has conducted for the last few years with the object of creating prejudice against the Development Directorate and Government.

11. The statement that on the 25th January 1925 I submitted a report to Government in which I apprehended a serious loss, is I believe untrue. My files on the subject are not in my office having been sent for by the Honourable Member, but as far as I remember my first report dealing with the dredging in the season 1924-25 was submitted in May 1925.

12. In paragraph 34 of his statement (page 14-A of the typed copy) Mr. Nariman says " Had Sir Lawless Hepper anything to do with this as the head of the Ministry of Munitions?" This is an insinuation in which I think he has allowed himself to indulge on former occasions. The facts are these. The Munitions Board was appointed by the Government of India and formed part of the Central Government. Local circles, under a Controller of Munitions, were formed in Calcutta, Bombay and Karachi. I was asked by Sir Thomas Holland, President of the Munitions Board, if I would take over the appointment of Controller of Munitions, Bombay Circle, in addition to my duties as Agent of the G. I. P. Railway. I did so and acted in that capacity for 18 months, my principal activity being to organise the transhipment of military stores and munitions between the Railways and the Shipping Department, in regard to which there had been at first some confusion leading to serious detentions to rolling stock. The sale of the " Kalu " was effected by the Government of India, though whether by the Munitions Board or not I am unable to say. In any case I had nothing whatever to do with it, and was not aware of the transaction until after I became Director in November 1920.

13. With reference to the allegations made by Mr. Nariman in paragraphs 41-47 and 49 of his statement (pages 19-22 of the typed copy), I attach a statement by the Chief Engineer with the subject and also a statement dealing with certain points raised by Mr. Husseinbhoy Laljee. It will be seen that it is correct that when work was first started at Colaba, certain work orders were given without inviting tenders, for the reasons given by Mr. Elgee. It is of course entirely at the discretion of the Chief Engineer to invite tenders or not in any particular case, and although tenders are always called for where the work is of a straightforward character, I am satisfied that, under the conditions prevailing at Colaba when the works were commenced, a departure from the usual custom was justified.

14. A perusal of the figures given by the Chief Engineer show clearly that Mr. Balkishandas Seth was not favoured in any way, and that the rates paid to him were the same as to other contractors. The suggestion that he had any sort of monopoly of the work is definitely untrue. The contract files are submitted in original for the perusal of the Committee, and all contracts with Mr. Balkishandas Seth have been marked for ready reference.

15. In regard to the opening of the tenders for unloading and spreading moorum on the reclamation, it will be seen that Mr. Nariman's allegations are false. The original tenders as received are submitted for the information of the Committee.

16. The next allegation I desire to refer to is contained in paragraphs 36-37 of Mr. Nariman's statement (pages 24 and 25 of the typed copy). This refers to the purchase of steel bars in connection with the housing scheme and has nothing to do with the reclamation scheme. As however Mr. Nariman's evidence on this point was admitted

in his oral examination, I understand that the Committee will permit a reply to be made to his charges. I accordingly attach a statement by Mr. Harvey, Superintending Engineer, Housing and Suburban Circle, which deals with the matter fully. Mr. Harvey's files dealing with this case are submitted in original with all references marked. The explanation, which is a perfectly simple one, was given by the Honourable Member in October 1924 in reply to Mr. Nariman's question in Council (see page 735, Volume XIII, Bombay Legislative Council proceedings, copy attached). The reply to Mr. Nariman states the position in the clearest possible terms, and any fair minded person of average intelligence would be satisfied with the explanation given. It is difficult to understand the persistency with which Mr. Nariman pursues this subject on any other hypothesis than that it is his deliberate intention on every possible occasion to try and blacken the character of Government officials. He apparently does not mind if the statement is untrue, so long as its constant repetition is calculated to lead the public to believe it.

17. In his oral evidence, as reported in the press, Mr. Nariman appears to have gone further than in his written statement. He is reported to have stated—

(*a*) That the alteration from $\frac{5}{8}''$ to $\frac{7}{8}''$ bars was made intentionally by the Superintending Engineer in order that the manufacturers might be benefited;

(*b*) That in regard to favouring a particular contractor there was an ulterior motive, and

(*c*) That the alterations resulted in a loss of Rs. $2\frac{1}{2}$ lakhs.

I submit for the consideration of the Committee that, in view of the explanation already given to Mr. Nariman, these allegations are clearly malicious, and that no privilege or protection should be accorded in respect of them.

18. I have not complicated this note by reference to minor allegations regarding incompetency of staff, stores addressed to Sir George Lloyd, and other matters of the nature of bazaar gossip, which form much of Mr. Nariman's stock in trade. I have confined myself to the greater allegations. My officers and I will however be glad to answer any questions on which the Committee may desire information.

H. A. L. Hepper,
Director of Development.

Replies of T. Harvey Superintending Engineer, Bombay Development Directorate, to the inaccurate statements and allegations made by Mr. K. F. Nariman in his written statement and in his evidence before the Back Bay Enquiry Committee on 21st August 1926.

A

I. The points mentioned in Mr. Nariman's statement may be enumerated as follows:—

" (1) That an Executive Engineer had prepared an indent to be forwarded to *Manufacturers at Home* for a large quantity of mild steel bars *for concrete piles for the Reclamation work* and the size mentioned in the original indent by the Executive Engineer was 5/8".

(2) That the 5/8" *was altered* after the indent was prepared into 7/8" *by the Superintending Engineer.*

(3) The quantity required was about 1,200 tons *costing nearly 3 lakhs of rupees.*

(4) The indent *thus altered* was sent *by the Superintending Engineer to the Home Firm* and the bars arrived which were required for the works.

(5) *They were deposited in Matunga Surplus Depôt* and a *fresh indent had to be sent with correct specification* and *fresh consignment arrived.*

(6) *The amount of nearly 3 lakhs of rupees of the first consignment was purely wasted.*

(7) When a question was raised about it in the Council in the course of debate, the Development Director admitted it but stated that the said alteration was due to a trifling error. No effort was made to explain how such a trifling error could have occurred, particularly when the indent was originally *correctly* prepared by one Engineer and *deliberately altered* by the superior and no explanation was forthcoming.

(8) Further in order to pacify the Council and to show that this trifling error had not cost any loss, the Director stated that there was no loss to Government and *he gave the Council to understand that they were utilized on some other works* and had caused actually a saving.

(9) That these bars amongst others were subsequently offered for sale.

(10) Further comments on such an attitude are needless and I leave it to the Committee to draw its own conclusions."

II. Before dealing with these points seriatim, it is necessary to give a clear statement of the case.

On the 10th February 1922, under this office No. S.—5/599 the Executive Engineers, Bombay Housing Districts Nos. I and II, were requested to send in their requirements of steel for the year 1922-1923. The list was sent by the Executive Engineer, Bombay Housing District No. II, for the work at Worli on 17th March 1922 under his No. 792. This list required alterations and was returned to the Executive Engineer and a revised list was submitted by him under his office No. 1480, dated 23rd May 1922.

On account of alteration in chawl design, the list was further revised and re-submitted by the Executive Engineer under his No. 1869, dated 15th July 1922.

The list showed that 511½ tons of steel had to be ordered from the High Commissioner and a certain number of bars—the weight of which was not given—had to be ordered locally in order that the work might proceed pending the receipt of the steel from England.

The lists of the Executive Engineer for Naigam and DeLisle Road were submitted under his No. 3251, dated 24th July 1922 and under his D. O. dated 31st July 1922 which showed that 1,412 tons had to be ordered from the High Commissioner and a further quantity locally.

The lists of the two Executive Engineers were checked and consolidated in this office (Superintending Engineer's) and the consolidated list amounting to 2095·57 tons of steel required for *beams, columns, floors, walling, etc.*, was sent to the Superintending Engineer, No. IV Project Division (Materials), under this office No. S.—5/3329, dated 5th August 1922 for placing indents locally and *with the High Commissioner* (*through the Local Government*) for 526·95 and 1568·62 tons, respectively.

No sooner had the consolidated indent been sent to the Superintending Engineer, No. IV than it was discovered from enquiries made by the Executive Engineer, Bombay Housing District No. 2, that his indent *did not include* steel bars required for *foundation piles*.

The matter was verbally discussed in this (Superintending Engineer's) Office with the Executive Engineer, whereupon *that Officer* worked out the number of bars required and *on his statement* this *office Supervisor* was directed to *add* the bars required to the consolidated statement, which he did, but unfortunately 7/8″ bars were entered instead of 5/8″ bars.

The Superintending Engineer, No. IV Project Division, was notified of the *addition* under this office No. S.—5/3371, dated the 8th August 1922.

Tenders were then called for by the Superintending Engineer, No. IV Project Division, for the steel to be purchased locally which was awarded to Messrs. Shalebhoy Tyabjee & Co. of Bombay, whose tender was the lowest and the indent for the remaining steel was sent *through the Local Government to the High Commissioner.*

Subsequently when the delivery of steel was being made by Messrs. Shalebhoy Tyabjee it was discovered by the Executive Engineer, Housing District No. II, that the 7/8″ bars were not required for piles but 5/8″ bars instead but *it was too late to cancel the order* for the 7/8″ bars placed with them since already many of the bars had arrived in Bombay.

The High Commissioner was *cabled also to alter the indent for 7/8″ bars to 5/8″* but the order had already been placed by him with manufacturer and could not be altered.

Since it was considered that a loss was likely to accrue though the use of these 7/8″ bars in piles in place of 5/8″, it was proposed by me to substitute these bars, where possible for an equivalent section of bars of smaller diameter in beams, columns, etc., and to use the 5/8″ bars in piles and further to reduce the cement in the mixture of concrete by 10 per cent. in consequence of the additional strength given by the bars to columns, etc. Consequently all beams, columns, etc., were re-designed and the substitution was made where possible throughout the remaining chawls of the scheme.

In all out of the 80,000 bars of 7/8″ diameter ordered 46,340 were used up in this way without loss and the remaining 33,660 or 574 tons were transferred to surplus stock along with 1,826 tons of steel of other diameters.

It may here be explained that when this still was ordered there was no question of curtailing the programme of chawl construction from 625 to 207 chawls and only about nine months afterwards was it decided to do so, with the result that a large surplus of steel remained. Had the programme been continued, 10,000 tons more of steel would have been required in addition to the suplus stock to complete the work.

It may further be explained that had the original programme been pursued the 163 chawls to be constructed at Worli, the 25 chawls in the Flats, and the 90 chawls at Dharavi all required pile foundations and that for this operation allowing 5 per cent. for piles broken either in handing or driving, etc., in all 121,400 bars were required. Most of these bars had to be ordered well in advance so that the piles would be cured before being driven and so that the construction could proceed in all sites when the land was handed over by the Improvement Trust.

This explains the reasons for ordering so many bars and it was only due to the subsequent elimination of 42 chawls at Worli, 25 chawls at the Flats and 90 chawls at Dharavi from the programme that all the bars were not brought into use.

The 7/8″ surplus bars were subsequently sold for Rs. 102-8-0 per ton along with the other surplus steel.

III. *These are the true facts of the case* and referring to the numbers given above to the points raised in Mr. Nariman's statement, I will proceed to point out the gross inaccuracies and want of knowledge of fact or procedure contained therein.

(1) (*a*) The indent was sent to the *High Commissioner* and not to *Home Manufacturers;*

(*b*) The Executive Engineer's indent *did not* in the first place contain steel bars *for piles,* but it contained bars for *every other* purpose including *5/8″ bars (for beams, etc.),* to the extent of 31,454 bars only or 231 tons of bars varying from 13 feet to 19 feet.

(*c*) The indent had *nothing* to do with the reclamation work; it was prepared for the Housing Scheme very few concrete piles were used on the reclamation Scheme.

(2) (*a*) *No alteration* was made to the indent for 5/8″ bars the order was placed for the 231 tons, referred to above, the 7/8″ bars required for piles were ordered *in addition to this 231 tons of 5/8″ bars.*

(*b*) *The Superintending Engineer* did not make the *addition;* it was done by the *Supervisor* of his Office immediately after the discussion with the Executive Engineer concerned.

(3) The quantity of 7/8″ bars ordered was 1,388 tons at an approximate cost of *Rs. 2,25,000.*

(4) Of the 7/8″ bars *30,000* were ordered locally on tender and *50,000* through *the High Commissioner.*

(5) Only *sufficient 5/8″ bars to make an economical re-arrangement with 7/8″ bars* (in all 281·76 tons) were ordered in the succeeding indents for steel.

(6) There was no loss except *that due to the curtailment of the programme* which could not be foreseen and which in any case would have accrued had 5/8″ bars been ordered instead of 7/8″. This will be apparent from my statement and when I add that out of 80,000 bars ordered 46,370 were used up on one-third the original programme leaving 33,660 bars to be used up in the remaining two-thirds which was contemplated when the order was placed, and this could easily have been done.

(7) The Director of Development possibly did not explain how the error had occurred, since he was satisfied with the arrangements made to see that no loss would accrue and which be explained fully to the Council.

(8) The surplus of these 7/8″ bars, *i.e.,* 520 tons, were sold with the remaining surplus material amounting in all to 2,400 tons.

(9) The Committee will doubtless be able to form its own conclusions from the foregoing statement and replies to the points raised by Mr. Nariman and its members will be able to judge what amount of reliability that can be placed in his statements.

IV. From my statement of facts, it will be apparent how the mistake arose, but whether the Executive Engineer or myself intimated the incorrect diameter of steel to the Supervisor or whether the Supervisor through an error entered the incorrect diameter, I am unable to ascertain as nothing now appears on record: Naturally, however, I take full responsibility for the transaction.

B

Regarding the allegations made to the Commission of Enquiry by Mr. Nariman, that the object of the mistake was to place a large order and so extract large secret commission from Manufacturers, I would state that there were two sources through which manufacturers' commission could be obtained: (1) Messrs. Shalebhoy Tyabjee & Co. who supplied the steel purchased locally and (2) through the High Commissioner Messrs. Shalebhoy Tyabjee & Co. placed the order direct with manufacturers and it was not known who these manufacturers were till the test certificates came through with the steel, and since Messrs. Shalebhoy Tyabjee were fined Rs. 6,000 for being late in delivery of steel they were not likely to pay any commission. Regarding the High Commissioner it is only necessary to point out that his orders are placed direct with manufacturers who are not known in India.

T. HARVEY,

Superintending Engineer, Housing and Suburban Circle.

22nd August 1926.

Question No. 14 put by Mr. K. F. Nariman, M.L.C. (Bombay City, South), at the ensuing session of the Legislative Council

Mr. K. F. Nariman, M.L.C. (Bombay City, South) asked—

14. (*a*) Will the Honourable the General Member be pleased to state whether it is a fact that about two years ago an indent for 1,200 mild steel bars for concrete piles of the size 5/8″ and of the value of about Rs. 2,50,000 was made by the Executive Engineer in charge and that in the said indent the size of the said bars was altered by the Superintending Engineer to 7/8 ?

Indent for mild steel bars, Development Directorate.

(*b*) If so, will the Honourable the General Member in charge be pleased to state whether it is a fact that on account of this alteration in the indent mild steel bars of the size 7/8″ arrived in Bombay, whereas the requirement of the Directorate was for size 5/8″ and that the said large quantity of bars of the value of nearly Rs. 2,50,000 are thus lying unserviceable in the stores of the Development Directorate, which have been unable to re-sell them in spite of public advertisement ?

(*c*) Will the Honourable the General Member in charge be pleased to state whether it is a fact that a second indent with the correct size required namely, 5/8″ had to be sent ?

(*d*) If the reply to (*a*) and (*b*) be in the affirmative, will the Honourable the General Member in charge be pleased to state whether any action has been taken in the matter ?

The Honourable Mr. Cowasji Jehangir (Jr.), C.I.E., O.B.E., replied—

14. (*a*) The facts are not as stated but are as follows :—

The Executive Engineer sent in his indent for steel which the Superintending Engineer scrutinized. He discovered that the Executive Engineer had omitted from his indent the bars necessary for making piles.

The matter was discussed with the Executive Engineer with the result that the bars required for piles were added to the Executive Engineer's indent by the Superintending Engineer's office supervisor apparently on the verbal instructions of the Superintending Engineer who has accepted responsibility in the matter.

The diameter of bars added to the Executive Engineer's indent was 7/8″, whereas bars of 5/8″ diameter were actually in use at the time.

(*b*) It is not a fact that the bars are lying unserviceable. When the error was discovered, the piles and frame-work of chawls at Worli were redesigned utilizing 7/8″ instead of 5/8″ bars without loss to Government. The 7/8″ bars so far thus used up amount to over 800 tons. It is not possible at this stage to state what bars, if any, will be surplus to the Department as this depends on whether the chawl construction programme is to proceed after the chawls now under construction are completed. If any bars remain over, it will be due to the curtailment of the original programme for which the steel was necessarily ordered in advance. If it is found necessary to dispose of the bars at any time, Government anticipate that there will be no loss on the transaction.

(*c*) This is not a fact. On the other hand only a sufficient number of 5/8″ bars to make an economical re-arrangement of re-inforcements was ordered in the succeeding indent for steel.

(*d*) No action was considered necessary.

(Signed) J. R. MARTIN,

Secretary to Government,
Development Department.

Un-official reference no. 12/S.D., dated the 10th October 1924, to the Secretary to the Legislative Council, with reference to his no. 2751, dated the 28th August 1924.

Reply to Mr. Nariman's allegations

The reasons for placing work with Contractors without first inviting tenders are given in my statement regarding the allegations made by Mr. Husseinbhoy Laljee a copy of which is attached hereto.

The statement that the work was given at exorbitant rates has to be proved. I can find no evidence of this.

Copies of contracts concerned are forwarded herewith.

The means of introduction of Mr. Balakishendas Seth to this Department is dealt with in my statement in reply to Mr. Husseinbhoy Laljee.

A comparison of the rates charged by Balakishendas Seth (a better expression would be rates dictated to Balakishendas Seth) with the rates given to other contractors will show that for similar works the rates are identical.

I attach hereto a statement showing such works and the rates paid to the various contractors employed. It will be seen that the rates are identical. A reference has been given to the number and date of the contract in each case so that the particular contract can be traced in the contract files submitted herewith. The contracts with Balakishendas Seth have been flagged in these files for easy reference.

A wide shallow area existed between the Marine Lines Colaba Railway and the foreshore at R. L. 91, the level to which the filling was to be carried out. It was not practicable to fill this area by dredging. It was therefore decided to fill this area by using spoil from the Quarry as and when this was available.

The original rate paid for this work which was intermittent and sandwiched in with other work already in progress was Rs. 2-8-0 per 100 cubic feet which is equivalent to Re. 0-10-10 per ton or Rs. 10 per wagon of 400 cubic feet. This rate was subsequently reduced to Rs. 1-8-0 per 100 cubic feet equivalent to Re. 0-6-6 per ton or Rs. 6 per wagon of 400 cubic feet. I am unable to give reasons for the original rate of Rs. 2-8-0 or for the reduction to Rs. 1-8-0. When earth filling by tipping and spreading from the cross bund or wall was taken in hand as an alternative means of employment for labour engaged for the Storm Water Drains the rate given was Re. 0-3-6 per ton. In this case the depth of filling was considerable and the lead was limited to 50 feet. The rate is equivalent to Rs. 4-6-0 for a 20-ton wagon.

References to these contracts are given in the accompanying comparative statement from which it will be seen that this work was not the monopoly of one man as suggested, but the work was divided between the contractors engaged on other works in the area.

When work on Storm Water Drains had been stopped and we were moreover in a position to promise a definite daily supply of murum tenders for unloading and spreading were invited.

Rates for unloading and spreading to three different leads were invited. The contract was then given to Messrs. Shamji Gokal and Son who quoted Re. 0-2-0, Re. 0-2-3, Re. 0-2-6 for the three leads respectively. This rate for the lead of 100 feet is equivalent to Rs. 2-8-0 per wagon of 20 tons.

I am unable to supply any information as to Balakishendas Seth's private circumstances other than that which is contained in the letters of introduction with which he came to this Department.

It is correct that he has carried out works for this Department of a total cost of Rs. 8,99,400.

The usual procedure when tenders are called for by me is for a box to be placed in Mr. Thomas' room into which tender forms are placed as and when received. The box is locked and the key is kept in the office safe, keys of which are kept by myself and Mr. Thomas.

As soon after the time advertised as the latest time up to which tenders will be received has passed the box is brought into my room, opened there and the envelopes are taken out. These are then opened by me and the details are entered in tabular form on a sheet drawn up for the purpose.

In the case now under discussion, tenders for unloading and spreading murum in the Reclamation area were called for. The latest time for receiving tenders was advertised as 12 noon (S. T.) on 22nd February 1926.

At about 12·20 p.m. (S. T.) on that day Mr. Thomas came to my room and said that there were a number of contractors waiting in his office and that they had asked if the tenders could be opened then in their presence. At the time I was extremely busy and replied that this not usually done and that as I had some urgent work in hand I was unable to deal with the tenders at that moment and was unable to say when it would be possible for me to do so. I instructed Mr. Thomas to reply to the Contractors accordingly. This I understand he did and the contractors without any further protest went away.

Some little time afterwards when I had disposed of the work immediately before me I opened the sealed tenders myself and as I read out the results Mr. Thomas wrote them down in the form of a statement. The original statement is attached. After examining the rates tendered and the general conditions of the tenders I invited the five firms or individuals whose rates were the most favourable to come to my office and show to me how their rates had been arrived at. On the results of these interviews I proposed to award the contract. In the meantime however I was informed by the Director that a complaint had been made to the Honourable Member and he instructed me to send the tenders with my recommendations to him.

This I did.

I now forward herewith the tenders as received.

Had the contractors who asked for the tenders to be opened in their presence repeated their request it is quite probable that I would have agreed to it. There was no reason for them to have made their request through Mr. Thomas. They could have asked direct to see me or even after having received my reply through Mr. Thomas there was nothing to prevent them on leaving his office, from sending in a card to me asking for an interview which would certainly have been granted at once.

By orders of the Honourable Member Balakishendas Seth is prohibited from carrying out further work for this Department.

A contract for painting pontoons at Shewa was made with Balakishendas Seth because he already had huts and coolies on the spot and it was obviously more economical to place the work with him than with another man who would have to go to the expense of constructing a camp and importing the coolies.

A circular on the lines indicated by Mr. Nariman was issued in May 1921. This has always been kept in mind but owing to the difficulty in getting work carried out it has been necessary to depart from the procedure laid down.

A list of the tenders received for quarrying stone at Kandivli is submitted herewith. On this occasion the tenders were opened in the presence of the contractors as it was anticipated that it might not be expedient to place the contract with the firm giving the lowest tender. This was explained to the persons present on that occasion, 11th September 1922, and that or during the days immediately following would appear to have been the time to protest against the contract being given on these conditions.

The contract was placed with one Ramachandra Patkar who had been working at Kandivli during the period of the opening up of the quarry site.

It was considered by Mr. O'Rorke who was then Acting Chief Engineer that the rates quoted by this man were the lowest at which the work could be safely carried out. At that time progress on the construction of the wall was the essential thing and the guarantee of a regular and efficient supply of stone was all important.

The quarry was selected for the stone supply. It was hoped that a large quantity of murum would be obtained from there and this hope has been justified but a reference to the report accompanying the sanctioned Project Estimate, page 6, paragraph 73, shows that it was never expected to obtain the whole of the murum required from the quarry site.

	Rs.	a.	p.	
Contract No. 1, dated 9th August 1921, with Sadamji Ramji—				
For supplying Ballast at site	18	0	0	per 100 cubic feet.
For supplying Rubble at site	14	0	0	„
Contract No. 2, dated 1st September 1921, with Goolam Mohamed—				
For supplying Ballast at site	17	8	0	„
For supplying Rubble at site	13	8	0	„
Contract No. 3, dated 27th July 1921, with Ramrao Narayanrao—				
For supplying Ballast at site	18	0	0	„
For supplying Rubble at site	14	0	0	„
Contract No. 5, dated 21st September 1921, with Laxmichand Dulabdas—				
For supplying Ballast at site	18	0	0	„
For supplying Rubble at site	14	0	0	„
Contract No. 16, dated 6th December 1921, with T. C. Verma Brothers—				
For supplying Ballast in reserve	18	0	0	„
For supplying Rubble at crusher	14	0	0	„
Contract No. 17, dated 6th December 1921, with Balakishendas Seth—				
Supplying Ballast at site	18	0	0	„
Supplying Rubble at site	14	0	0	„
Contract No. 18, dated 9th December 1921, with Fazal Karim Sethi—				
Supplying Ballast at site	18	0	0	„
Supplying Rubble at site	14	0	0	„
Contract No. 2, dated 17th April 1922, with T. C. Verma Brothers—				
Constructing Tramway rubble mound	7	0	0	„
Contract No. 3, dated 11th April 1922, with Balakishendas Seth—				
Making rubble mound for mass concrete wall (Stone is limited to 1 cubic foot size as a minimum). ...	8	0	0	„

	Rs.	a.	p.	
Contract No. 9, dated 9th June 1922, with Balakishendas Seth—				
Constructing Tramway boulder mound ...	7	0	0	per 100 cubic feet.
Contract No. 11, item 3, dated 9th June 1922, with Knapp & Co.—				
Forming rubble bank	7	0	0	,,
Contract No. 19, dated 19th July 1922, item 6, with Seva Ram—				
Boulder filling including packing	7	0	0	,,
Contract No. 5, dated 6th May 1922, with T. C. Verma & Co.—				
Boulder stone pitching	7	0	0	,,
Contract No. 10 of 25th May 1922 with Balakishendas Seth—				
Boulder stone pitching	7	0	0	,,
Contract No. 23, dated 9th August 1922, with Knapp & Co.—				
Excavation in earth	4	0	0	,,
,, in sand	2	0	0	,,
,, in murum and boulders	7	0	0	,,
Cement concrete in founds 1, 2, 4	1	12	0	per cubic foot.
Contract No. 37, dated 25th October 1922, with Balakishendas Seth—				
Excavation in earth	4	0	0	per 100 cubic feet.
,, in sand	2	0	0	,,
,, in murum and boulders	7	0	0	,,
Cement concrete in founds	1	12	0	per cubic foot.
Lime concrete in founds	60	0	0	per 100 cubic feet.
Dry rubble stone masonry	8	0	0	,,
Rubble stone masonry in lime	65	0	0	,,
Contract No. 19, dated 19th July 1922, with Seva Ram—				
Excavation in foundation	12	0	0	,,
Cement concrete in foundations 1, 2, 4	1	12	0	per cubic foot.
Rubble masonry in lime mortar	65	0	0	per 100 cubic feet
Cement concrete in floor	2	0	0	per cubic foot.
Rubble masonry in cement and sand	100	0	0	per 100 cubic feet.
Contract No. 11, dated 9th June 1922, with Knapp & Co.—				
Removing spoil consisting of boulders brought in by Government ballast train and leading same to where required and forming banks with correct slope including all lift	5	0	0	,,
Contract No. 47, dated 7th February 1923, with Balakishendas Seth—				
Forming bank correct slope with quarry rubble supplied by Government including all lead and lift	5	0	0	,,
Contracts Nos. 31—35, 37, 39, 42, 43—49 of 1922-23 with Balakishendas Seth.				
Contracts for various camps and works buildings compare with contracts Nos. 12, 13, 20, 22, 25—28 of 1922-23 with T. C. Verma Brothers,				
and with contracts Nos. 14, 16, 38 and 40 of 1922-23 with Khoda Mulji.				
Contract No. 17, dated 6th September 1923, with Balakishendas Seth—				
For removing rubble, mixing and placing mass concrete in gantry race including forms. Government to supply all necessary ingredients for concrete at site	25	0	0	,,
Contract No. 19, dated 26th October 1923 with T. C. Verma & Co.—				
For fixing and placing mass concrete in drains including placing and moving the gantries with shuttering complete. Supplying and fixing all shuttering required for manholes and minor drains. Government to supply all ingredients for concrete at site	30	0	0	,,

	Rs. a. p.	
Contract No. 17, dated 22nd September 1924 with Fazalkarim Sathi—		
For removing rubble and mixing and placing mass concrete in gantry races including forms ...	25 0 0	per 100 cubic feet.
Contract No. 28, dated 20th August 1924 with B. K. Seth—		
Excavation in foundation in any class of material ...	11 0 0	,,
Excavation in soft rock or murum	13 0 0	,,
Mixing and placing mass concrete in foundation and races (labour only) using contractor's own forms...	25 0 0	,,
Making boulder embankment	6 0 0	,,
Linking tram track	0 1 6	R. ft.
Contract No. 11, dated 27th June 1924 with T. C. Verma & Co.—		
As above at identical rates.		
Contract No. 22, dated 18th December 1924 with Fazal Karim Sethi—		
Excavation in dredged earth up to 4′ depth ...	8 0 0	per 100 cubic feet.
Excavation in earth from 4′ to 8′ including timbering	10 0 0	,,
Filling in spoil	1 8 0	,,
Excavation in rock	20 0 0	,,
Removing rubble for laying pipe and replacing same.	6 0 0	,,
Providing rubble and packing under pipe in soft earth	6 0 0	,,
Providing and fixing 6″ dia. earthenware pipes ...	1 0 0	R. ft.
Do. 9″ do.	1 12 0	,,
Do. 12″ do.	2 8 0	,,
Contract No. 23, dated 2nd February 1925 with Balakrishendas Seth—		
As above at identical rates.		
Contract No. 1, dated 23rd April 1923 with Balakrishendas Seth—		
Excavation in any class of material for S. W. Drain.	11 0 0	per 100 cubic feet.
Contract No. 4, dated 25th April 1923 with Fazal Karim Sethi—		
Excavation in any class of material for S. W. Drain.	11 0 0	,,
Contract No. 24, dated 4th February 1924 with T. C. Verma and Bros.—		
Excavation in any class of material for S. W. Drain.	11 0 0	,,
Contract No. 7, dated 21st May 1923 with Balakrishendas Seth—		
Unloading and neatly stacking any class of material where indicated including all lead and any necessary hand shunting of wagons (Contractors will be held responsible for any demurrage charges that may occur)	0 10 0	per ton.
Contract No. 18, dated 24th September 1923 with T. C. Verma & Bros.—		
As above.		
Contract No. 29, dated 11th March 1924 with Balakrishendas Seth—		
Spreading Quarry spoil between M. C. Railway and existing foreshore	2 8 0 (0 10 10)	per 100 cubic feet. per ton.
Contract No. 30, dated 26th March 1924 with Fazal Karim Sethi—		
As above	2 8 0	per 100 cubic feet.
Contract No. 1, dated 4th April 1924 with Fazal Karim Sethi—		
As above	1 8 0 (0 6 6	per 100 cubic feet. per ton.)
Contract No. 2, dated 4th April 1924 with Balakrishendas Seth—		
As above	1 8 0	per 100 cubic feet.
Contract No. 8, dated 27th May 1924 with T. C. Verma & Co.—		
As above	1 8 0	,,

Contract No. 7, dated 29th June 1925 with Balakrishendas Seth—				
Unloading and spreading quarry spoil or murum brought in by Government ballast train free of lead up to 150'	0	4	0	per ton.
Contract No. 9, dated 30th June 1925 with T. C. Verma & Bros.—				
As above	0	4	0	„
Contract No. 10, dated 15th September 1925 with B. K. Seth—				
As above but lead up to 50'	0	3	6	„
Contract No. 11, dated 20th January 1926 with B. K. Seth—				
Spreading quarry spoil or murum between M. C. Railway and existing foreshore to elevation R. L. 91·00 including all lead and lift	0	6	0	„

Reply to Mr. Husseinbhoy Laljee's allegation

When work first commenced at Colaba it was very difficult to get contractors to take up work there owing to the limited accommodation available and the distance of Colaba away from a Bazaar. Of those contractors who did take up work several went away after a short time and gave up the work.

The first contracts were those connected with quarrying and collecting stone from the foreshore for the construction of the wall. Until the supply of suitable stone was assured the construction of the wall could not be commenced. A good deal of trouble was being experienced in this, either through contractors being unable to keep their labour or through the contractors themselves leaving the work and going away when Balakrishendas Damodardas came to the Chief Engineer with a very strong letter of recommendation from the Agent, E. B. Railway and another from Lt.-Col. Stean, Divisional Recruiting Officer, Kirkee. (Copies attached hereto.) He was therefore sent down to the Deputy Chief Engineer at Colaba with the recommendation that if occasion arose he might be given a trial. In consequence of this he was given a similar contract to those already in force for quarrying and collecting stone. He carried out this work to the satisfaction of the Engineer in charge of the work.

Of seven contractors who had undertaken this work three only, *viz.*,

T. C. Verma & Bros.,
Balakrishendas Seth,
Fazal Karim Sethi,

were able to carry them on successfully, so that subsequently when similar works were to be carried out by contract these three firms were given preference, and it is admitted that in most cases the formality of calling for tenders was dispensed with.

In this connection I forward herewith a copy of D. C. E., Colaba's No. 604, dated 14th March 1925, on this subject.

I am unable to trace any works on which rates at 150 in excess of market rates have been paid either to Balakrishendas Damodardas or to any other firm.

The Deputy Chief Engineer's note of 14th March 1925, explains why work of unloading stone and murum was placed with two firms only without calling for tenders.

I would add here that the supply of murum and stone at this time was not regular, the quantities of stone to be unloaded at Colaba depended upon the requirements of the work there whilst the supply of murum was dependent upon the number of wagons available after the requirements of Marine Lines and Colaba Works for stone had been satisfied.

With regard to the allegation that tenders for loading and unloading stone and dry filling from Kandivlee Quarry had been accepted at prices higher than the lowest rates tendered, this is correct. The reason being that in these cases I was satisfied that the firm or individual quoting the lowest rates would be unable to work to them which would result, if these tenders were accepted, in dislocation of the work. But the man mentioned, *i.e.*, Balakrishendas Damodardas was not given work in either of these cases.

In this connection I forward herewith files of—

(1) Petty contracts made from 1921 onwards.
(2) Bill books from 1921 onwards showing payments actually made to contractors.
(3) Tenders received for quarrying and loading stone at Kandivlee.
(4) Tenders received for excavating and loading murum at Kandivlee.
(5) Tenders received for unloading and spreading moorum.

(Signed) H. A. ELGEE,
Chief Engineer.

Copy of letter No. 92/127/58/1 dated 5th October 1921 from the Lt.-Col. H. Stean, Recruiting Officer, Kirkee, to the Chief Engineer, Back Bay Reclamation Scheme, Bombay

I have the honour to forward letter No. 369 dated 13th August 1921, from Mr. Balkrishendas Seth to me for favour of your consideration and hope you will kindly excuse my doing so. What the applicant says about his recruiting work is true, and he has been of very great service to Government. If the offers that he makes in his letter could be of any value to you then I would recommend him very strongly as deserving of being given a chance of competing with other applicants for such orders in his line as you may have to give.

Copy of letter from Lt.-Col. H. Cameron, Agent, E. B. S. Ry., to Sir Lawless Hepper, Director of Development, Bombay

My dear Hepper,

I returned to the East to-day and would have come and seen you but that I leave to-night for Calcutta. I must congratulate you on your new appointment which I fancy should prove more congenial in these days, than managing a Railway. I did not unfortunately get the Calcutta P. C. job, so have had to come back to the old one. I hope you will forgive us in giving this letter of introduction to Mr. Balkrishendas Seth of 24, Mangalore Street, Fort, Bombay. He hails from the Punjab and has had Railway experience as contractor. He now is the agent for a group of Bengal Collieries but is anxious to get local contracts for labour or materials or buildings. He has some 800 men at his command and also plant. I have known him in the Punjab and have always understood him hardworking, ambitious, straightforward man and as such have taken the liberty of bringing him to your notice as you are no doubt if you consider his qualifications and credentials good enough to put work in his way. He also, I understand, is financially well placed.

I am, very sincerely,
(Signed) H. CAMERON.

Copy of letter No. 4-604 dated the 14th March 1925 from the Deputy Chief Engineer, Colaba, to the Chief Engineer, B. B. R. S.

Reference:—Your No. 700 dated 7th March 1925 regarding Piece Work Contracts (Form K-2).

In answer to your above, I beg to state that owing to the difficult nature of the works at Colaba the major portion of same is being done departmentally with the following exceptions:—

1. Storm Water Drains.
2. Moorum filling to foreshore and
3. Unloading material.

1. *Storm Water Drains*

In order to ascertain the actual cost of the construction of these drains, the work was first started departmentally and a very careful record maintained of the true cost. Having obtained this data, I interviewed a number of petty contractors with a view to giving this work out on contract, but due to their lack of experience in this class of work they were unable to give me rates neither were they prepared to accept mine, in fact they were most unwilling to undertake a work, seemingly so tedious and laborious knowing that the working hours would be limited due to the tides and that night work was necessary. After sometime Contractors B. K. Seth and T. C. Verma, accepted my rates (both being unable to submit theirs) and are at present engaged on the drains work. As their progress of late has been so poor it certainly appears that we shall have to take over this work departmentally.

2. *Moorum Filling to Foreshore*

During certain tides it is not possible for coolies to work on Storm Water Drains, therefore, in order to keep these coolies fully occupied I gave the work of spreading moorum to the drain contractors and thereby preventing the possibility of these men submitting claims for labour sitting idle. Unfortunately, as we have nearly completed the moorum filling and as we have no other job on which these coolies can be engaged

when unable to work on drains, I shall not be a bit surprised if the drain contractors endeavour to give up drain work. The rates were originally Rs. 2-8-0 per 100 cub. ft., but I have since reduced this to Rs. 1-8-0 per 100 cub. ft. The names of the Contractors are :—

1. B. K. Seth, and
2. T. C. Verma and Bros.

3. *Unloading Material*

As the traffic wagons loaded with cement, etc., are not delivered daily at Colaba it would not be possible for a contractor other than one engaged on the works to undertake this work as his coolies would have nothing to do on numerous days until the arrival of loads. I therefore gave the unloading work to Contractor B. K. Seth and on the understanding that he would be responsible for all demurrage charges. The rate is similar to what is in force elsewhere on the Back Bay Reclamation. (Annas ten per ton).

Statement of Work to be done

Name of work.	Quantity.	Rate.	Cost.
		Per cent. cub. ft.	Rs.
S. W. D. No. 2. (Contractor B. K. Seth.)			
Excavation	51,822	20	10,362
Rubble filling	77,412	7	5,419
Concreting in race	11,484	25	2,871
Do. in drain	60,698	30	18,209
			36,861
S. W. D. No. 3. (Contractor T. C. Verma and Bros.)			
Excavation	1,18,208	20	23,642
Concreting	97,891	30	29,367
Rubble filling	1,32,984	7	9,309
			62,318
S. W. D. No. 4. (Contractor T. C. Verma.)			
Excavation	1,87,756	20	37,551
Rubble in founds	1,71,432	7	12,000
Concrete in founds	29,177	25	7,544
Do. in drains	86,617	30	25,985
			83,080
Spreading Moorum	Approximate cost.	....	10,000
Unloading Materials	Do. ...	.....	13,000

38th Witness

The Honourable Mr. Cowasji Jehangir, Member of Council

Written Statement by the Government of Bombay in reply to the questions asked by the Back Bay Enquiry Committee in a letter addressed to the Honourable Mr. Cowasji Jehangir (Jr.) dated the 11th of August 1926.

Q.—Are there any records to show that Sir George Lloyd or the local Government consulted any independent expert besides Sir George Buchanan before accepting his scheme?

A.—There are no records to show that Sir George Lloyd or the local Government consulted any independent expert besides Sir George Buchanan before accepting his scheme. Government had, however, before them the report submitted in 1911 of Messrs. Lowther, Kidd & Co.

Q.—Who decided that the wall should be built from both ends and what were the reasons for this decision?

A.—The following is all the information regarding point No. 2 which has been found in our records :—

(i) In paragraph 47 of his report of September 1919, Sir George Buchanan wrote " If my proposals as to method of carrying out the work and time for completion are approved, the programme of construction would be as follows and in the order given :—

(1) Order dredging plant;
(2) Order railway tip wagons;
(3) Open up quarries for stone and murum;
(4) Begin building of wall from the Colaba end.

(ii) Telegram from the Governor of Bombay, Ganeshkhind, to the Secretary of State, London, despatched 4th July 1920 :—

" Following for Sir George Buchanan. Begins. Back Bay. His Excellency would be glad of your telegraphic opinion as to feasibility of beginning work at both ends at the same time. Military authorities concerned in getting reclaimed land adjacent to Colaba are anxious that Colaba end should be reclaimed as early as possible. On the other hand, His Excellency believes you considered necessary to start western end first on account of railway communication. Ends."

(iii) Telegram* from the Secretary of State for India, London, dated 15th July 1920 to the Governor of Bombay :—

* The Secretary of State's telegram of 12th July in reply to the Governor of Bombay's telegram of 4th July had apparently not been understood on receipt, a repetition of it was accordingly asked for and this telegram is the repetition.

" Your telegram of the 13th. My telegram of 12th repeated. Begins. Buchanan reports that it is practicable to begin work on the Back Bay Scheme at both ends simultaneously. In constructing the wall the bulk of the work would be carried out from the western end, the stone being conveyed to the site by rail from the quarries near Andheri, but a considerable length of wall could be built from the eastern end as the wall would be concrete throughout and sufficient stone could be procured locally. To begin building the wall in two places will not materially advance matters unless reclamation can also be proceeded with and Buchanan is considering whether the new dredger and the ' Kalu ' can work simultaneously at eastern and western areas. Buchanan understands Lewis is on his way home and he will discuss all these points fully with him."

(iv) Telegram from the Secretary of State for India dated London 17th July 1920 to the Governor of Bombay :—

" Your telegram of the 4th instant and my reply repeated July 15th Buchanan reports now satisfied himself that dredger ' Kalu ' and the new dredger can work together on Bombay reclamation and therefore work on construction of the wall can proceed from both ends simultaneously. Buchanan asks for very early orders as to whether he is to proceed on these lines as considerable changes in designs and arrangements for execution of work will be necessary."

(v) Telegram from the Governor of Bombay dated 29th July 1920 to the Secretary of State for India, London :—

" Your telegram dated 17th July. Work may start from both ends."

(vi) Extract from report of Sir George Buchanan dated 7th February 1921 :—

" In the first instance, I proposed to build the wall for the entire length according to the cross section C. D. on the plan accompanying this report, with the exception of 2,500 feet at the Colaba end, where the reef was so high

that a plain concrete wall could easily be built. The whole of the stone for the rubble wall was to be obtained from a quarry to be selected on the line of the B. B. & C. I. Railway, and I proposed to begin construction from the Colaba end because the scar end of the wall would be better protected from the rough monsoon sea. On discussing my report with Government, the question of point of commencement was brought forward and I was told that Government would prefer the work to begin at Marine Lines, as the land there would be more valuable and more readily saleable. I decided that the difficulties attending the protection of the scar end were not insuperable and that railway connection at Chowpatti would be much simpler than at Colaba, it was therefore agreed by all parties that the work should begin at Marine Lines."

From item (ii) it appears that His Excellency Sir George Lloyd's object in asking whether it was feasible to begin work on the wall at both ends was to enable Government to get the land at the Colaba end reclaimed as early as possible because there was a ready purchaser in the Military authorities.

Q.—Who advised the local Government to buy the s. s. Kalu for £75,000? Was any certificate obtained that the Kalu was in good working order and worth the price asked?

A.—In September 1919, on the advice of Sir George Buchanan, the Government of India were asked to telegraph to the War Office not to sell the "Kalu" without reference to the Bombay Government which would probably require it. Sir George Buchanan considered that the "Kalu" would do very well for the east Colaba Reclamation. On 20th October 1919, the Government of India were informed definitely that this Government would require the Kalu. The Disposal Board at Home accordingly reserved the Kalu for this Government at a price of £75,000, the amount of a tender or tenders already received by them for it. On 21st November 1919, the Bombay Government wired to the Government of India "Will pay seventy-five thousand pounds for Kalu." There is no indication in the records that any expert was consulted about the price, or that any certificate was obtained that the Kalu was in good working order and worth the price asked; but Sir George Buchanan was available locally for consultation. In March 1916, the Kalu was surveyed by the Chief Constructor and the Inspector of Machinery of the Royal Indian Marine Dockyard, Bombay, and the Surveyor to Lloyds Register, and certified by them to be in good working order. It is understood that from that date the Kalu remained in charge of the R. I. M., Bombay on behalf of the Imperial Government. In April 1919, the Ministry of Shipping valued the vessel at £100,000. The officiating Director, R. I. M., in his No. 4905/T., dated the 13th August 1924, has stated "the Port Trust official to whom the dredger was handed over (on behalf of the Development Department) on 5th July 1920 received it in good order and condition."

Q.—Were the Port Trust and the R. I. M. Authorities consulted by the local Government regarding—

(*a*) their previous experience of dredging;

(*b*) the availability of the proposed areas for dredging in the harbour

before the scheme was adopted?

A.—There is nothing in the records indicating that the local Government consulted either the Port Trust or the R. I. M. authorities regarding these matters before the scheme was adopted.

Q.—Was there any independent check of Sir George Buchanan's estimate of Rs. 367½ lakhs; were any supplementary details of the estimate furnished other than the general figures embodied in his report?

A.—In or about the year 1912 the Public Works Department prepared a detailed estimate for roads, lighting and drains in the area to be reclaimed and also a lump sum estimate for sewerage, and placed them at the disposal of Messrs. Lowther, Kidd and Company. It appears from the tables given in paragraph 38 of Sir George Buchanan's report of September 1919 that he examined and utilized the former estimate making an allowance for increase in prices since 1912. The Public Works Department file containing these estimates and the correspondence regarding them is in the hands of the Committee.

Apart from that nothing has been found in the records showing that there was any independent check of Sir George Buchanan's estimate of Rs. 367·61 lakhs, or that Sir George Buchanan ever furnished detailed figures of his estimate in supplement of the figures given in his report and its appendices.

Q.—Why was the dredger ordered in advance of the sanction of the scheme in view of the fact that it could not be employed immediately on its arrival?

A.—The records show that the Secretary of State was urged by this Government to sanction the placing of the contract for the dredger as early as possible, because the price of such plant was advancing rapidly and it was extremely probable that delay would entail a great increase in cost. The price quoted by Messrs. William Simons and Company, Limited, in September 1919 had in January 1920 been increased by them by

10 per cent., and this quotation was open only upto 10th March 1920. The Secretary of State in a telegram to the Viceroy dated 4th May 1920, in which he communicated his general approval of the scheme, also intimated that he was separately sanctioning the purchase of the dredger. On 7th May, the Government of India informed this Government that the Secretary of State had sanctioned the purchase. The contract was placed by the Director General of Stores, India Office.

Sir George Buchanan did not consider that the dredger, if ordered at once, would necessarily be ready long before it was required. On 26th February 1920, he wrote "if the dredger is ordered before 12th March it will be just possible to have it at work by November 1921, so there are 20 months in hand for the building of the first section of the wall. This is none too much time, taking into consideration the 100 and 1 things to arrange and the plant to be bought before actual construction can begin and it will be necessary to make a supreme effort to start the work by the end of next monsoon or say at latest by November 1920."

Chairman.—You are a member of the Government of Bombay?

A.—I am.

Q.—We have to put you questions regarding certain alleged irregularities in the expenditure and conduct of the Back Bay Scheme. In the course of the examination of witnesses several of them have made specific allegations. This is our last sitting to take oral evidence and our time is limited. I trust you will not mind if some of the questions are direct and have an unpleasant look on the surface?

A.—Not at all.

Q.—If after these questions are answered we require any further information, we will trouble you to furnish the same in writing. What was the object of starting this reclamation scheme: was it for profit or because land was in demand?

A.—I may point out to start with that my evidence on most points will not be first-hand as I was not a member of the Government of Bombay at the time. What I say is from the records. The exact objects for which this reclamation scheme was started I cannot find directly from any records. But from my knowledge of Bombay and from yours you know, Sir, (and another member of your Committee also) that those were boom times and land values were as high, as they have been perhaps in the history of this city. There was a great demand for office accommodation and residential accommodation. You have only to make enquiries from men in Bombay well conversant with the circumstances of those days and you will find that it was not possible to get an office or a shop. One of the reasons for the Rent Act in the city was the want of accommodation and the profiteering that was going on, and I believe that it was considered that trade was hampered for want of accommodation. Another reason I see now for this reclamation is the profit. Several private companies were prepared to undertake the scheme and take the profit for themselves, as we see from our records which have been supplied to you.

Q.—How many?

A.—I understand there was one syndicate formed with Sir Sassoon David, Mr. Lallubhai Samaldas, Sir Shapurji Bharucha, Sir Vithaldas Thackersey and Sir Fazulbhoy Currimbhoy in 1917. There was another by the Tatas. And you will find that Sir George Carmichael wrote a note for Government after consultation with the two syndicates which had combined. That clearly shows that, in the opinion of those financial authorities, the scheme was a paying proposition.

Q.—On the land values it was not a paying proposition?

A.—It was considered by those financial gentlemen a paying proposition. I shall read to you a letter signed by three prominent gentlemen of Bombay.

Billimoria.—It was on the basis of 367 lakhs that it was a paying proposition?

A.—The letter shows that there was no calculation at all. It was only based on Mr. Kidd's report.

Q.—May we have the date of your taking charge of this department?

A.—I took charge of this department by the end of June 1923. I was an acting Member of Government before. This letter is dated the 8th December 1917 and is signed S. B. Bharucha, Lallubhai Samaldas and Vithaldas Thackersey. It runs as follows:—

> "We have the honour to draw your attention to the previous history of the above project. The Government of Bombay obtained a report from Messrs. Lowther, Kidd and Co. in the above matter and a committee was appointed by the Government to report upon certain matters in connection with the project. As most of the then available vacant land south of Byculla under the Improvement Trust has since been leased and as the demand for land in the city of Bombay is increasing, we believe the time has come when it is possible to undertake this work by private enterprise. As we believe that the reclamation project of 1912 is a sound business proposition, we are prepared to take up this work without any Government guarantee and we hereby apply for the necessary permission of the Government to do the same and to sell the land thus reclaimed. The above permission

should include the concession in paragraphs 28 to 30 of the Report of Messrs. Lowther, Kidd and Co. dated the 12th August 1912. In consideration of this permission we are prepared to give Government the option to take up 294 acres required for the Government House recreation ground and gardens at cost price on completion of the reclamation. We may mention that if we get your permission at an early date we are confident of successfully floating a company with the necessary capital to carry on the reclamation. We shall therefore be obliged for an early reply."

Q.—You might find that directly after that Col. Grisewood on behalf of Messrs. Lowther, Kidd and Co. strongly objected to any concessions being granted to this syndicate. That is why the Government decided not to enter into any contract with any private syndicate but to do the work departmentally?

A.—That may be so.

Chairman.—In the first telegram from the Viceroy to the Secretary of State given on page 47 of the compilation relating to "The Bombay Housing and Development Scheme" you have these words:—

"These problematic difficulties are not to be compared with the certain danger of further inactivity and delay."

I suppose this refers to the housing scheme? Again on page 48 you have the statement "some risk must be run in order to end the present intolerable condition of affairs". What was the intolerable condition referred to here?

A.—It might refer to the housing scheme, but I think it refers to the entire project.

Q.—I want to know whether you think that at that time there was any danger in delaying the work?

The Honourable Mr. Cowasji Jehangir.—Danger to whom?

The Chairman.—To the citizens of Bombay or danger of discontent on the part of the public. I want your personal opinion.

A.—I think the words "intolerable, etc." refer to the housing problem. The difficulty in Bombay was that more accommodation was required, and it was also acute for the better classes generally. The problem which was dangerous (if you use the word dangerous), was the housing of the labouring classes which was also part of the development scheme.

Q.—That was one of the reasons why the scheme was rushed, *viz.*, the development project and also the Back Bay scheme?

A.—If you refer to the very first speech of Lord Lloyd, you will find that he talks about the great desirability of doing something for the labouring classes and for the improvement of the slums. That was in December 1918.

Q.—We are talking about the origin of the scheme. Why was not the work allowed to be carried out by the Public Works Department in the usual way?

A.—I must state that here I am not speaking from the records. The Public Works Department had enough work to do, and if you did entrust it to that department you would have had to enlarge the Public Works Department and its organisation.

Sir Frederick Hopkinson.—And the Public Works Department had no experience in marine work?

A.—No.

Q.—That would be one reason for not giving it to the Public Works Department?

A.—There were no engineers in the Public Works Department who had any experience of marine work.

Chairman.—Usually when any new kind of work has to be done, the Department controls it with the aid of experts?

A.—I think that the Government of Bombay thought that this was too big a project to entrust to the Public Works Department. Their hands were rather full, and it would be more efficiently done by a separate department; and efficiency was the point on which the Government of Bombay laid considerable stress.

Q.—This being a huge undertaking why was not more than one expert consulted?

The Honourable Mr. Cowasji Jehangir.—You ask me why one expert only was consulted?

The Chairman.—Yes.

A.—Messrs. Lowther and Kidd's report which was submitted in 1912 was very thoroughly examined by the Government of that day, the Governor of that day being an engineer himself, and the reclamation scheme was submitted for the sanction of the Government of India on the strength of Messrs. Lowther and Kidd's report alone. And in paragraph 12 of the letter of the Government of Bombay dated 7th August 1912, I find the following sentence:—"In presenting this report to the Government of India I may say that His Excellency (Lord Sydenham) has the fullest confidence in the ability and expert knowledge of Mr. Kidd who has worked it out in detail". Therefore, according to the Government of Bombay at that time, the first expert opinion was that of Lowther

and Kidd and they took a second expert opinion to confirm or otherwise Lowther and Kidd's report, that opinion being Sir George Buchanan's. In the principal details you will find that Sir George Buchanan agreed with Mr. Kidd. And therefore the Government of Bombay had two expert opinions, one taken in 1912 and the second taken in 1919 and the two expert opinions on paper seem to agree. For instance, in the main principles that reclamation is a possibility, that dredging is the method by which that reclamation should be undertaken, that you can have a dredger which would produce 2,000 cubic yards, that it could be done in a certain number of years: in all these particulars both these experts agree.

Q.—And Government thought that was enough?

A.—Yes.

Mr. Billimoria.—The most important point that arises out of this answer is that in 1912 the estimates came to 325 lakhs whereas in 1919 when Sir George Buchanan prepared his estimate it was 367 lakhs. It is all very well known that between 1912 and 1919 prices had gone up considerably; but no consideration had been made with regard to the rise in prices all round?

A.—You will see from Sir George Buchanan's report that he gives a statement. In paragraph 38 he compares his estimate with that of Mr. Kidd. You will see that he thinks that Mr. Kidd over-estimated in 1912. I am not an engineer and I express no opinion.

Q.—You are probably aware that even on the estimates of 1912 the Government of India were very reluctant to embark on a scheme of that description?

A.—I am aware of that fact.

Sir Frederick Hopkinson.—On page 13 Sir George Buchanan says, that dredging could be done at 5 annas a cubic yard. It is in Table A. The dredging plant alone cost about 11 annas per cubic yard before the dredging started. Was this a safe one?

A.—I do not want to express an opinion. But these were the figures on which the report was based.

Chairman.—It is stated that work was rushed in the face of public opposition. Was there any public opposition at the time?

A.—Again I speak in my individual capacity. The reclamation scheme was first announced I think in a speech in Council, and from the proceedings of the Legislative Council you are just as able to judge as anybody else whether there was opposition to it or not.

Q.—From your knowledge of those debates was the work rushed in the face of public opposition?

A.—I cannot say it was. The public of that day by no means set itself against the project. It is quite evident from the debates in the Legislative Council.

Mr. Billimoria.—But the Indian Chamber of Commerce did protest against it.

A.—I am not quite certain whether they protested immediately.

Q.—Directly they came to know of it?

A.—They may have. But you should look up and see what their representative said in Council.

Q.—Why was it that the Port Trust was not consulted? That is a question commonly asked?

A.—I am afraid, as I said before, that I was not a member of the Government of Bombay and as such am unable to answer that question. We have not got anything on the records to say why it was not consulted.

Sir Frederick Hopkinson.—You have given us everything on your record to show the inception of the scheme?

A.—The instructions of the Government are that every scrap of paper should be laid before you. For instance, I found this letter only to-day (showing a record) and I got it from the Public Works Department.

Chairman.—So far as you know that has been done?

A.—Yes.

Q.—Why was not the Royal Indian Marine consulted?

A.—My answer is the same. There is nothing on the records to show that.

Q.—I want to have these things on record as coming from you?

A.—There is nothing in the records to show that it should have been taken or it was not taken deliberately.

Sir Frederick Hopkinson.—Are there any files missing?

A.—Not missing.

Q.—Any records on the private files of the Government House about the inception of the scheme?

A.—Sir George Lloyd, I believe, had a private file; he must have written demi official letters; we have not got all those. He has taken away a good deal of private correspondence with him. We have not got them all.

Q.—Anything that you have left here that would help us?

A.—As I said, we have not got all those letters. Unless I read them I cannot say whether I can help you.

Q.—You have some?

A.—Very few; all the telegrams that would be of any assistance we have put in.

Chairman.—You first sent up an estimate for 4 crores for the sanction of the Secretary of State?

A.—We did not send up an estimate. We had Sir George Buchanan's report with the administrative sanction of Government on it; that is to say, Sir George Buchanan gave an estimate, and whatever there was of the estimate and plans had administrative sanction.

Q.—You wanted the Secretary of State's *administrative* sanction only and not *final* sanction?

A.—We wanted it under the rules prevailing at the time. The law and constitution provided that the Government of Bombay could not proceed with the scheme unless the sanction of the Government of India was obtained. Therefore, the Government of India, as they have done in previous years, had to put up the project for the sanction of the Secretary of State. I may point out that in sending this report, there were some very significant words which I would like to draw your attention to. " On the technical aspect of the new scheme the Governor-in-Council offer no opinion ".

Q.—We have got that?

A.—I have not got anything that you have not already got.

Mr. Billimoria.—You say that the members of the Governor-in-Council were consulted at that time, who were the members?

A.—There were only three members, Sir George Curtis, Sir George Carmichael and the Honourable Sir Ibrahim Rahimtullah. I think I am right in saying that the scheme was approved by the Governor and all the three members, and I may point out a significant passage in connexion with this in Sir George Buchanan's letter. " Sir George Buchanan himself did not take any borings nor in view of the urgency with which his report was required would there have been time to do so. We understand from Sir George Buchanan that Mr. Kidd's borings and estimate of quantities were also accepted as sufficiently accurate by the officials in the Public Works Department of the Government of India, when Sir George Buchanan at the request of His Excellency the Governor of Bombay went to Delhi specially to discuss the project with the Government of India and obtain their sanction and approval to the technical details of the scheme ". You will find that in the letter written by Sir George Buchanan as late as 15th October 1925.

Sir Frederick Hopkinson.—How does the Public Works Department come in here?

A.—That is to say, Sir George Buchanan was asked to place this scheme before the Public Works Department of the Government of India.

Q.—In 1919?

A.—Yes.

Q.—Did he place it before the Government of India?

A.—He went there specially for the purpose of doing so.

Q.—Had he any approval of the scheme from the Public Works Department?

A.—Since the Government of India sanctioned the scheme, I presume their expert advisers agreed and the Government of India acted on their advice.

Q.—Presumably they had investigated the prices and agreed that they were fair.

(The Secretary informed the Committee that he received this morning copies of the note recorded at the time of Buchanan's visit to Delhi.)

A.—You will now know more about it than I do.

Chairman.—Presumably the estimate for 4 crores was an approximate one?

A.—Certainly; it was not a detailed estimate by any means.

Q.—So the change from 4 crores to 702 lakhs was reported to the Secretary of State?

A.—It was not submitted to the Secretary of State for his sanction. I can give you reasons why it was not. Sir George Buchanan's estimate and report was obtained by the Government of Bombay before the Reforms. The seven crores and two lakhs, the first detailed estimate, was sanctioned in October 1922, which was after the Reforms. The Secretary of State in a Government Resolution has laid down the powers of the local governments in India.

Q.—You had issued a Government Resolution on his letter?

A.—No; this was a resolution of the Government of India issued on instructions and rules laid down by the Secretary of State. I propose to read the first paragraph of the Government Resolution. " His Majesty's Secretary of State in Council has been pleased to make the rules appended to this resolution defining the classes of expenditure on reserved provincial subjects which a Governor-in-Council may not sanction

without the previous sanction of the Secretary of State in Council. These rules supersede all previous rules of a similar nature, and subject to their observance, orders regarding specific cases of expenditure passed by the Secretary of State in Council or the Governor-General in Council under regulations previously in force, will no longer be binding."

Then, under the rules the local governments must obtain the sanction of the Secretary of State as regards works chargeable to capital expenditure, such as irrigation and navigation works, docks and harbours and upon projects for drainage and water storage and the realisation of water power under certain conditions. You will notice that if this was a new estimate it need not have gone to the Government of India. From the second part of the paragraph you will see that even the detailed estimate need not go to the Secretary of State.

Q.—Are these rules observed now?

A.—Certainly; they are the constitution of the country.

Q.—If you have to sanction a project, productive or un-productive, for 7 or 8 crores, you don't send it to the Secretary of State now-a-days?

A.—Unless it is an irrigation work, or a harbour work, navigation docks and upon projects for drainage and water storage and utilisation of water power under certain conditions.

Sir Frederick Hopkinson.—Under which head would this scheme come?

A.—Not in any of these. That is why the Government did not take the sanction.

Q.—It was not sufficiently comprehensive when the list was made? It might refer to marine work?

A.—That is a constitutional question you are asking, whether the Secretary of State should or should not have added an explanatory note on these lines.

Q.—This list would not cover all that?

A.—It has been held that it would not cover.

Q.—What do you say to marine work?

Chairman.—Reclamation is a special class of work which does not came under that head.

A.—Reclamation is a well-known type of work; it is not included. That is why the Government of Bombay did not send the 7 crores and 2 lakhs of rupees estimate for the sanction of the Secretary of State.

Sir Frederick Hopkinson.—Could you see any reason why reclamation should not be entered in that list?

A.—That is a constitutional point, and I don't think it is up to me to express an opinion just now as to whether it should or should not be.

Q.—It is a point worthy of consideration?

A.—When my opportunity for expressing an opinion comes I will do so.

Chairman.—Do not the Government of India demand estimates when they sanction loans for such purposes?

A.—No.

Q.—You have no authority to borrow money yourself?

A.—We have full authority.

Q.—You want the consent of the Government of India to borrow moneys?

A.—My own impression is that now under the Reforms we cannot borrow any money we like. The Government of India Act says: "A local Government may on behalf and in the name of the Secretary of State in Council raise money on the security of revenues allocated to it under this Act and make proper assurances for that purpose and rules made under this Act, may provide for the conditions under which this power shall be exercisable".

Sir Frederick Hopkinson.—Is it not the object of all this that the Secretary is to have control of the expenditure?

A.—That was before the Reforms.

Q.—And subsequently?

A.—Subsequently, no.

Q.—You have to get the permission of the Government of India before you go on with the Reclamation scheme?

A.—Just now because they originally sanctioned the project before the reforms. The Government of India have powers of supervision and control.

Chairman.—Under that ruling you have to submit the estimates to the Government of India?

A.—No.

Sir Frederick Hopkinson.—If they have power of supervision and control financially, they will have power in every other way?

A.—It is a constitutional question you are asking me.

Q.—They have the power of the purse?

A.—They have the power of the purse. These are the rules. Before we raise a loan we have to secure the sanction of the Government of India. " No loan shall be raised by a local government without the sanction of the Governor-General in Council, or (in the case of loans to be raised outside India) of the Secretary of State in Council, and in sanctioning the raising of a loan the Governor-General in Council or the Secretary of State in Council, as the case may be, may specify the amount of the issue and any and all of the conditions under which the loan shall be raised ".

Q.—You are controlled in the issue of loans. That covers the whole thing. If you cannot issue loans you cannot do the work?

A.—No; the Government of India have sanctioned it. The question is whether the revised estimate should be submitted to the Government of India or not. Then we have gone on to other constitutional question. The main point was—Was this Government under the rules and regulations obliged to submit the estimate to Government of India. That is the point.

Q.—Your estimate doubled itself; you have got to issue loans?

A.—As a matter of fact we have only raised one loan. The rest of the money has come as loans from the Government of India themselves. If they refused to lend money or refused to allow us to raise a loan, the Government of Bombay would come to a standstill.

Chairman.—They asked at the time they gave you the loan the purpose for which it was wanted and they scrutinised the budget?

Sir Frederick Hopkinson.—My point is that the Government of India has control over the Government of Bombay so far as the reclamation work is concerned—having the power of the purse?

A.—Theoretically, yes. They have the power of the purse, and they have to sanction loans; and we have got to get the sanction for loans under the Government of India Act. They have also powers of superintendence and control. I can give you the exact wording: " Subject to the provisions of this Act and rules made thereunder, every local Government shall obey the orders of the Governor-General in Council and keep him constantly and diligently informed of its proceedings on all matters which ought in his opinion to be reported to him, or as to which he requires information and is under his superintendence, direction and control in all matters relating to the Government of its province ". It is very wide.

Mr. Billimoria.—When did the rules under the Reforms come into force? Will you kindly give the date?

A.—They were issued on the 29th September 1922.

Q.—And the revised estimates were sanctioned in October 1922 by the local Government?

A.—Yes; I think so.

Chairman.—That was the reason why it was not submitted to the Government of India?

A.—That is not so, Sir.

Sir Frederick Hopkinson.—I suppose it was made in 1920?

A.—Not the project estimate.

Mr. Billimoria.—The project estimate was prepared in May 1922 and sanctioned by the Government in October 1922?

Chairman.—Since the revised estimate of 702 lakhs represented an increase of 75 per cent. over the estimate, should it not have been reported to the Government of India?

A.—I have given my answer to that question.

Q.—It is doubtful from what you have read that the Government of India have not got powers of control and sanction?

A.—It has been held by the financial authorities that no sanction was required.

Q.—Are they of the same opinion now?

A.—I think they are.

Q.—And then if the Government of India were not consulted why was not the Legislative Council consulted? That is one of the questions asked.

A.—I can point out to you that in June 1921, Mr. Monie, Secretary of the Department, wrote a letter to the Indian Merchants' Chamber giving detailed estimate at 850 lakhs. And in August 1921, Sir George Lloyd went to the Indian Merchants' Chamber and made a speech in which he also gave that figure of 850 lakhs with the interest charges.

Q.—In April 1922, Sir Chimanlal Setalvad gave a different account. He seems to have given a lower estimate. He adhered to the original estimate and he said that the rate was Rs. 10 a square yard, about four months before the project was finally sanctioned?

A.—That was in 1920.

Q.—I mean the 702 lakhs project was sanctioned in October 1922.

A.—Would you point out where he said that? I can make enquiries.

Q.—I think it was in the Council.

A.—I do not think it is quite correct.

Mr. Billimoria.—There is one thing I cannot understand. In 1921 a statement was made with regard to the estimates having gone up to 702 lakhs. Why was that kept back till October 1922? Why was not the sanction of the Council obtained before that date when it was known to Government in 1921? We find from the records that His Excellency made a speech to the Indian Merchants' Chamber. If you knew that figure why was not that brought before the Council?

A.—I understand that that figure was first roughly worked out and the information was given to His Excellency for the purpose of that speech, and the details had all to be worked out and they were not ready for actual sanction till October 1922. The rough figures were the same as the officially sanctioned estimate.

Q.—Mr. Monie wrote a letter in 1921?

A.—That was on the rough figures.

Q.—He had to take a year to have these fair figures compiled?

A.—Yes.

Sir Frederick Hopkinson.—It is a coincidence that he has given the same figure. It is a very remarkable coincidence.

A.—It is a very simple one. We can produce the file.

(*Sir Frederick Hopkinson.*—Well, I should like to see the file, very much.)

Mr. Billimoria.—Was it one of the reasons that if they had prepared the estimate in advance before the reforms came into force they would have to go to the Government of India for sanction? Was it on that account that it was kept back?

A.—I cannot say that from the papers.

Q.—What could be the object of withholding it for a year?

A.—Because it was not ready.

Q.—How was it? Because of the Reforms—so that they may not have an opportunity of going to Government and asking for sanction?

A.—I do not think so.

Sir Frederick Hopkinson.—They would at any rate.

A.—The records and papers show that they took this time to calculate. The audit report dated October 1922, just before it was finally sanctioned, shows that the project estimate of the Back Bay scheme—seven crores—was then under the consideration of the Finance Department and the local Government.

Mr. Billimoria.—What date is that?

A.—4th October 1922; just before it was sanctioned it shows that it was under examination.

(*Chairman.*—In September 1921, Sir George Lloyd put it at 702 lakhs.)

Sir Frederick Hopkinson.—It shows that the original project estimate was 702 lakhs. I have heard for the first time of an estimate for 850 lakhs.

A.—That is with interest: the other is a works estimate.

Q.—The project estimate should give the latest figure—that the scheme is to cost so much?

A.—For instance, the 367 lakhs does not include interest; that is a works estimate.

Q.—That is an engineer's estimate.

A.—It is. And the 850 lakhs that His Excellency mentioned in his speech to the Indian Merchants' Chamber included interest. That is the difference.

Chairman.—You have got the report of the advisory committee. You find on page 7 a statement I referred to just now, " Since March 1921, the prices of labour and material had not perceptibly increased ". Normally the sanction was given on the basis of 4 crores. No variation in the estimate was indicated upto 14th March 1921.

Then in September 1921 Sir George Lloyd raised the estimate to 702 lakhs in his speech to the Merchants ' Chamber. It was a big jump from 400 to 702 lakhs?

A.—Yes.

Q.—That amount increased in about 4 months' time. What were the reasons for that sudden increase?

A.—We had not got the revision then. Evidently when he read that statement in Council, he had not seen any revised figures at all. He did not know. As soon as he knew it, he announced it to the Indian Merchants' Chamber.

Q.—When the revised estimate of 702 lakhs was sanctioned, was the possibility of reclamation by earth filling considered?

A.—No.

Q.—If they had made calculations they would have found that the whole of the filling could have been done for a little over 5 crores.

A.—Earth filling? Where did you get that figure from?

Q.—I have been discussing with some witnesses. You may take it from me.

A.—I cannot accept that. I regret I cannot take that.

Q.—If you had filled with moorum you might have got it done for about 5 crores.

A.—By tipping? I am very much surprised to hear it.

Q.—You may consider that. If Government had known what it would have cost they would not have sanctioned the 702 lakhs estimate.

A.—That is a hypothetical question. If you ask me if so and so had known an estimate 10 years ago would he not have agreed to it, I am afraid I cannot tell you.

Q.—Because the dredger had been sanctioned, they did not go into it.

A.—I have not had anything put before me.

Q.—Was that question discussed?

A.—I can find no records whether it was discussed or not.

Mr. Billimoria.—You can assign no reason for the delay of one year with regard to the revised project estimate except that it was being scrutinised by the Finance Department.

A.—It was not ready.

Q.—Then it is your belief that it was not allowed to evade the vigilant eye of the Government of India or to avoid approaching the Government of India on the revised estimate.

A.—I can find nothing on the records to show that and I am prepared to show the files.

Q.—Our friend Sir Frederick thinks it is not likely to be in record.

A.—Whether this preparation and the report was deliberately delayed?

Sir Frederick Hopkinson.—Don't include me in that.

A.—That is what your colleague says. I thank you for not agreeing.

Chairman.—It is no imputation. This is an enquiry and we have got to go into such matters.

A.—I quite understand. Mr. Billimoria, you can verify that. It won't take you long to see whether there was delay in making these estimates. I can tell you that I have not gone into the thing from that point of view.

Mr. Billimoria.—What looks amazing is that in September 1921 it was submitted to the Indian Merchants' Chamber a year and one month after it was sanctioned by the Government. It took 13 months. Whether that delay was only a red-tape of the Finance Department or whether there was any reason for it, that is my question.

A.—You can see from the file. I can see no reason. Perhaps you are not aware how long it would take for a detailed estimate.

Q.—If you will kindly turn to Sir George Buchanan's report, Mr. Cowasji, you will find he has made a very very bold statement at page 13, at the end. " With reference to my estimate of the cost of the work at the present time, I have gone into the matter very thoroughly and I believe my figures to be reasonable and reliable. As a matter of principle I never over-estimate an estimate because although by so doing an engineer may get the credit for not exceeding his estimate, such a practice is not conducive to economical work and I prefer to make a fair estimate on the data before me, and try to keep within that amount."

A.—I have never seen an Engineer who would not say what Sir George Buchanan has said. They always say " this project estimate has been gone into and given to you with the greatest diligence ".

Sir Frederick Hopkinson.—What is the difference between the project estimate and the detailed estimate?

A.—When you want to give administrative sanction to a project Government have before them a project estimate which is not a detailed estimate. It is a rough outline in which the Engineers tell you what the scheme will cost. Then Government give the administrative sanction to that project. They give administrative sanction, that is to say, they are prepared to incur expenditure upon a detailed estimate. It costs them money and therefore before they incur the expenditure they want to see what the project is likely to cost. Then the detailed estimates are worked out and having sanctioned the detailed estimate the work begins.

Q.—Where is the detailed estimate of the Back Bay?

A.—702 lakhs.

Q.—That is the project estimate?

A.—The project estimate is 367 lakhs.

Q.—702 lakhs is the project estimate?

Chairman.—That is what we are told. That is why I am remarking on the co-incidence of the two amounts.

Sir Frederick Hopkinson.—It is stated here that the Project estimate was 702 lakhs. It is printed on the top of it occurring over and over again.

A.—It is the sanctioned detailed estimate.

Q.—We have only got two estimates: 367 lakhs and 702 lakhs. You are speaking of a third estimate. I want to know where the third is?

A.—There are only two estimates. There is an estimate on which administrative sanction is given to the scheme.

Q.—Now we come to 702 lakhs which is headed project estimate.

A.—No, it is detailed estimate.

Chairman.—Both mean the same thing.

A.—It is called detailed project estimate.

Q.—I want to know one thing. When they sent up the 4 crores estimate did the Government contemplate revising that estimate? Have you got anything on record to that effect?

A.—I will give you what Sir George Buchanan thought of his own estimate. This is a report of the Engineer-in-charge of the work dated 11th February 1922. "Under the rules of the Government of India for the carrying out of public works, the approval of my report, plans and estimates did not imply more than the accordance of administrative sanction to the scheme, and a detailed project estimate giving the fullest particulars under each head and sub-head should have been submitted before any actual expenditure was incurred."

Q.—If he said so in 1922 what is the good of that?

Sir Frederick Hopkinson.—He knows perfectly well that the expenditure has been incurred.

A.—Yes. He goes on to explain why works started without detailed estimate. Under the P. W. D. code work cannot be started without an estimate. He goes on to state as follows:—The preparation of this estimate would have taken a staff of Engineers at least one year and when completed would have been valueless for the same reason that contractors were unable to submit a firm tender and as time was of importance it was decided to proceed in anticipation of the sanction and to prepare the detailed project estimate as soon as reliable data had been collected.

Q.—You judge the whole by its parts, don't you?

A.—Yes.

Q.—If I am to judge that by the parts and if it will take a year you can easily judge my view.

A.—We have all got our opinions about Sir George Buchanan's estimates.

Mr. Billimoria.—You admit that in 1922 he had given reasons. Then where was the necessity for revision?

A.—The revised estimate was made by the Development Department.

Q.—He says, "signed and approved" on the 11th February 1922.

A.—He has given reasons in a report which I have marked for you. I can give you the exact extract from it. "It was on account of the rise in the cost of plant and materials and of exchange." He calculated exchange at the rate of Rs. 12 and when the plant was ordered it was Rs. 15. This is very important. Then he points out why the cost of the dredger went up. You have got all that on page 4 of the printed reports. The report is dated the 11th of February 1922.

Q.—We shall be able to get Sir George Buchanan's own words?

A.—I can only talk of the report. I have no personal knowledge.

Q.—Did Government accept that explanation?

A.—The report is rather interesting and is as follows: "In 1919, I obtained from Messrs. W. Simons & Co., Ltd., a tender amounting to £410,454 for the provision of the dredger and auxiliary plant. The tender was on the basis of rates current for wages and material with the proviso that all advances on these rates shall form an extra charge, at the same time Messrs. Simon & Co. offered to accept a total fixed price of £451,500 and take on their own shoulders the risk of further advance in the cost of labour and material. I also made arrangements with the Tata Electric Power Company to supply current for the working of the auxiliary dredger.

"Unfortunately sanction to the purchase of the dredger was not received in time to take advantage of Messrs. Simon & Co.'s offer, which was only available for three months and when the case was re-opened by the India Office in May 1920 and the order placed, the total amounted to over £650,000, an addition of £200,000, of which £100,000 was due to the fact that in 1920 the Tata Electric Power Company were unable to guarantee

the supply of current, and an expensive steam auxiliary dredger had to be substituted for the electric plant." £100,000 is the increase for the change of circumstances and the other £100,000 is for the plant.

Q.—The Government accepted his version just as they accepted the original estimate?

A.—No, they actually ordered out the dredger.

Chairman.—I want to ask a few questions about the dredger. Why was the question of guarantee omitted from the agreement between the Manufacturers of the dredgers and the Government?

A.—Why a test in Bombay was omitted I cannot tell you, but Government had reports of very good tests in England, on the Clyde.

Sir Frederick Hopkinson.—That is usual and customary in all contracts. No contractor will give you a guarantee unless he has visited the site and knew all about it?

A.—A specification was drawn up by the Naval Architect to the Secretary of State.

Chairman.—In the case of the "Kalu" guarantees were given and were actually insisted on. That is the usual practice and that should have been done in this also.

A.—I can see from the records that the agreement was drawn up in England.

Q.—Who checked it on behalf of the Government of Bombay?

A.—It was drawn up by the Stores Department under the expert advice of the Secretary of State's Naval Architect and Sir George Buchanan was also paid 1 per cent.

Q.—Then the Engineers are responsible for the purchase of the plant and machinery from Messrs. Meik and Buchanan?

A.—I will let them speak for themselves.

Sir Frederick Hopkinson.—It does not matter what they say. There is a definite agreement.

A.—"My firm was entrusted with the taking in of tenders and supervision of manufacture and the greater part of my time and of our staff has been occupied in that connection....."

Q.—There must be somebody on behalf of the Government to scrutinise the specifications. He can only recommend. He cannot place orders.

A.—On his recommendation and that of the Development Engineers.

Q.—Did they check it?

A.—For instance, a good deal of plant was recommended by the Chief Engineer or the Director. Orders were sent to Sir George Buchanan who agreed to order them out. That is always the procedure.

Q.—Then you appoint an Engineer. You ask him to order materials for you without anybody checking on your behalf?

A.—No, Sir. That is not the position. Either Sir George Buchanan suggests some plant or the Chief Engineer. If they disagree, then the Director puts up a proposal using his discretion, to the Government.

Chairman.—I am not imputing any motive. There is a local Chief Engineer who is a gentleman appointed by Sir George Buchanan. Was it safe for Government to allow such a state of things, *i.e.*, to allow the Engineers to order any material they want, without the department or any one examining?

A.—There is the Director there to.....

Q.—The Director said that he left everything to the Engineer. He says Sir George Buchanan was solely responsible?

A.—If the Director thought that a plant was not necessary it was his duty to draw the attention of the Government of Bombay. If the Government were convinced that the Engineer-in-Charge was recommending a plant that was not necessary that would be a very good reason for asking him to go away.

Q.—That is an extreme step?

A.—You must realise that Government appoint responsible engineers to give advice. If they have reasons to believe that their advice is not good, they send them away. That is the only way in which work can be carried out.

Q.—You can have some other expert to advise you. Would it be safe for Government to entrust such a thing as the ordering of a huge plant like this to one engineer only?

A.—Take an instance. Supposing a certain number of cranes are required. The Chief Engineer puts up a proposal. The Government agree that these cranes are required. Do you mean to say that Government should take outside opinion?

Q.—Would not a prudent Government do that? You appoint an engineer. You give him authority to make purchases to any extent he likes.

A.—If you are the engineer in charge of a work, you ask for certain plant, and if Government went and called in another expert to check your figures would you like it?

Q.—I say the plant may be all right. It is about the placing of the order with the firm.

A.—How much it cost? That is done by the High Commissioner.

Q.—He does it only nominally. The order is all worked up here and handed over to the High Commissioner.

A.—When an order is sent from the Local Government to the High Commissioner, the latter places the order in the market and the specifications are worked out before hand.

Q.—You appoint one engineer and then entrust him with the sole responsibility for placing the orders with a firm. It is wrong.

A.—Do you mean the placing of the order or do you mean deciding the plant you require? The placing of the order is in the hands of the Secretary of State.

Q.—Do you mean to say you cannot invite tenders?

A.—No, we can't. The High Commissioner does it.

Mr. Billimoria.—In this case the High Commissioner places his order of his own accord?

A.—There are two points; what plant is required and who places the order. The placing of the tenders is in the hands of the High Commissioner. He asks for tenders and places it in the cheapest market.

Q.—He sends to you for approval.

A.—No.

Q.—Surely, he is appointed to do the work.

Chairman.—The Local Government have to find the money, they have to consider whether it is within their means to order such a plant.

A.—They get an idea of what it is going to cost. If they want it they send out to the High Commissioner. If the Government think that they ought to know what is the likely cost they may ask the High Commissioner. I have done it myself.

Sir Frederick Hopkinson.—Three machines were required. The specification of a particular machine is sent to England, which goes to the High Commissioner. He gets the prices, but he does not like them and goes where the prices are lower. He accepts the second best machine that is not at all suitable.

A.—That has happened. That is why the Local Governments are complaining so often.

Q.—Did you invite tenders and scrutinise them locally for the dredger?

A.—No.

Chairman.—The order was placed with a firm of Engineers approved by Sir George Buchanan.

A.—The order of the dredger was placed with the lowest tenderer.

Q.—Have you got copies of tenders?

A.—I have seen it in records that Simsons & Co. was the lowest tenderer.

Q.—I wanted to know whether any scrutiny was exercised by the Local Engineers.

A.—Their duty is to say what plant is required and they decide that.

Q.—Do you sanction the plant separately?

A.—Yes.

Q.—How is that?

A.—If the Engineers recommend that a certain plant is required you have got to sanction it. If you do not, you take the responsibility of not sanctioning it. Do you take a second opinion? I say we do not.

Q.—I would consult a number of experts before getting the sanction of the Government.

A.—When the Chief Engineer puts up a proposal, he consults his Engineers. There is the Director again.

Q.—If you have a competent man to carry out the scheme and he asks for certain tools and the Government were not going to supply .....

A.—Either they would sanction them or if the advice was not sound they would send him away.

Sir Frederick Hopkinson.—Government could not turn him out without paying him under the agreement.

A.—Sometimes. There may be other circumstances.

Q.—Do you see my point?

A.—Yes. That is exactly the position in a big engineering work. It is the engineer who must tell you what plant is required.

Chairman.—There is Sir George Buchanan who was the engineer responsible for the work and there is the Chief Engineer who is an officer selected by him. These two gentlemen decide what material should be ordered and prepare an indent and hand it over to the High Commissioner.

A.—They send it to Government. The Government must sanction it. After it is sanctioned it is the High Commissioner who purchases it.

Q.—Then you sanctioned the dredgers without seeing the tender?

A.—Yes. They decide that the dredger should be bought. Specifications are drawn up and sent to the High Commissioner. The High Commissioner purchases it.

Q.—It comes to this the Engineer practically does the whole thing.

A.—He does not, such as the tender.

Q.—He recommends.

A.—No. The High Commissioner may take his opinion or not.

Q.—Invariably Sir George Buchanan has recommended.

A.—Sir George Buchanan happend to be in England at the time. I have seen tenders sent out for other big schemes, not one or two but a dozen and I see the specification is drawn up by the engineer and sent to the High Commissioner who settles the tender. May I point out that I have had one case? I asked the Chief Engineer in another work to tell the High Commissioner not to accept a tender without consulting us. But the High Commissioner could object to it.

Q.—Would not the Local Government have done well to scrutinise the indent?

A.—Sir George Buchanan was going up and down between Bombay and London and the cheapest quotation was accepted. As to specification it is quite another matter. What could Government have done? They could accept the cheapest tender. If the specification was not what it ought to have been it was somebody else's fault.

Q.—You can't fix the responsibility. You name a man as an engineer?

A.—You appoint a responsible man and he makes a mistake.....

Q.—Supposing the responsible man does not carry out his responsibility what hold have you on him?

A.—No. We have not any hold.

Q.—Is it not desirable to insist on guarantees?

A.—If you appoint a responsible gentleman who is well known in his profession with his reputation at stake, you have done your best. If a doctor comes to treat you, when he does the wrong thing, your relations cannot claim damages.

Sir Frederick Hopkinson.—You will call in some other doctor.

A.—Yes.

Q.—Sir John Biles is the Technical Adviser.

A.—We paid him 1 per cent. commission.

Sir Frederick Hopkinson.—My own doctor says that he had consultation with 5 or 6 other. He tells me, " if you don't do what I want I will have nothing to do with the case."

Mr. Billimoria.—Were the Government satisfied that Sir George Buchanan had the necessary qualifications?

A.—If they employed an engineer I presume they believed that he was a good man, and the best man they could obtain. That is a presumption which one must make.

Q.—The Secretary of State was asked to recommend a suitable engineer and in the meantime Sir George Buchanan was appointed?

A.—No, not in the meantime. It was within an interval of 3 months. There is probably a confusion about Sir George Buchanan being asked to report and his being appointed. It is true that before Lord Lloyd's time the Secretary of State was asked to send out an expert and there was delay. Then we find that the Secretary of State suggested the name of Mr. Frederick Palmer but he could not come out till October. The Government of Bombay from the point of view of Bombay thought that it was necessary for the expert to be out here and see monsoon conditions. I imagine that from this time the name of Sir George Buchanan was considered by the Government of India. Here is a telegram from the Governor of Bombay to the Secretary of State on the subject. It is dated 8th April 1919 and runs :—" I have consulted the Government of India and Sir Claude Hill concurs with me in proposing you should send expert out at once who should arrive Bombay not later than 3rd week of May. Failing your inability to find expert in short time available, my Government would agree to using Sir George Buchanan whose services would probably be available and whom the Government of India recommend." The cable continues : "My telegram has been drafted in consultation with the Government of India and is being communicated to them ". That is from the Governor of Bombay to the Secretary of State. Then we come to this :—" My Government have decided to ask Sir George Buchanan to come to Bombay as soon as possible and report upon the Back Bay Reclamation Scheme. The matter was fully discussed with Sir Claude Hill before leaving." Sir Claude Hill was a Member of the Government of India.

Q.—Would delay have prejudiced the interests of Bombay in getting the best man available?

A.—My personal opinion is that we must not forget the atmosphere prevailing during that time, but looking back now, I think there would have been no difference. You must try to put yourself in the atmosphere that existed at the time when there were two very powerful syndicates knocking at Government's doors asking for this concession, syndicates which contained the best known men in Bombay. Then naturally if you see that the best financiers in Bombay are ready to take up this scheme and take all the profits and if you were a member of Government you would try to hurry up this scheme.

Q.—You believed you had the right sort of man?

A.—You must take it for granted that the Government of Bombay thought so. He may not be the right sort of man, the Government may have been badly advised. This is the only telegram I have got to show that he was recommended by the Government of India or it may be they got him on their own initiative. They thought, I am certain, that in Sir George Buchanan they had got a very good man. Then Mr. Billimoria is well aware that private companies have also entrusted their work to experts whom they thought to be the best in the world but yet they failed.

Chairman.—Did no one on behalf of the local Government scrutinise the tenders for the dredgers?

A.—We are not allowed to do it. Tenders are generally settled by the High Commissioner.

Q.—But the Government of Bombay could have told the High Commissioner. Will you kindly send us these tenders and we will advise you what we want?

A.—They may have said that.

Q.—Of course you agree now from experience that the specifications were incomplete?

A.—I am not an engineer and on a professional question like that I am not in a position to express an opinion. All I can say is this that it did not come up to the expectations and the gentleman who drew out the specification told us that we should get 2,000 cubic feet per hour and we did not get it.

Q.—It did not work up to specifications as the specifications were incomplete?

A.—I cannot express an opinion.

Q.—The tests made on the " Clyde " were incomplete?

A.—I would refer you to the High Commissioner where the records are kept.

Q.—Is it not the responsibility of the Local Government to advise the High Commissioner what they want? Is it not the business of the Local Government to give its own opinion?

A.—They got reports from those who were expected to report to them that the dredger had completed its tests most successfully and instead of doing 2,000 cubic yards it had done 2,500 cubic yards per hour. When you get a report of that sort you have reason to be satisfied.

Mr. Billimoria.—Who are then to be held responsible for the failure?

A.—Looking back at it now—I was not a Member of Government then and I am looking at it impartially—I hold that Sir George Buchanan drew out a specification of the dredger which could not, in the circumstances, produce 2,000 cubic yards. If it is possible (I do not know, that a larger dredger can be made or a dredger can be manufactured to produce 2,000 cubic yards per hour in the circumstances) he ought to have specified and ought to have suggested a dredger which could do it. If it could not have been done, his estimate for 2,000 cubic yards was wrong and he ought to have said it can only produce 1,000 cubic yards. He ought to have told us or ought to have been in a position to express a correct opinion as to how many hours the dredger could actually pump in an open sea. Therefore he went wrong. The other point on which he went wrong is the class of material that was in the harbour. That is my personal opinion from reading all the papers.

Q.—Who else is responsible besides him?

A.—Sir George Buchanan was the cause of it. I am not answering this question on behalf of Government, it is my personal opinion. I have given you my candid opinion I think about the failure and you may take it for what it is worth. I may be wrong and probably you will find I am wrong, but this is my candid conclusion.

Q.—This conclusion is arrived at after perusing all the papers that you took the trouble of going through?

A.—It is as a result of seeing the papers but also the taste of the pudding is in the eating.

Chairman.—When you found that the dredger was not giving the specified output did you take any steps to have it examined by other experts with a view to making alterations or improvements.

A.—The dredger started working on the 8th December 1923. On the 14th of February 1924 Sir George Buchanan wrote a report which reached me at the end of March

1924 in which he said that the dredger had worked satisfactorily up to the 11th of February. I will read it:—

"I believe I may say the result up to date has been quite satisfactory. The material in the harbour has proved much harder than we were led to suppose, and actual reclaimed land can be seen and walked upon by any one who chooses to go to Colaba." .....

"The best thing that can be said at present is that a good start has been made and every effort will be strained to work the dredgers both in Back Bay and the Harbour on double shifts at the end of the Monsoon."

I had a personal conversation before that, when he was here, about the dredgers and he told me that the work was very satisfactory and he had effected savings of 17 lakhs of rupees.

Q.—Who were the other Members of Government at that time? Were all of them present at the time the project was sanctioned?

A.—The Members of Government at the time were Sir George Carmichael, Sir George Curtis and Sir Ibrahim Rahimtullah.

Q.—We understand that Sir Chimanlal Setalvad is in London; will Government kindly induce him to remain there to give evidence? I ask this because we fear he may leave before we reach there.

A.—I will be pleased to do what I can but it is for you to arrange for your witnesses. But if I can help you I will do it. What is the help you want from me?

Q.—I have already said that we want Government to inform him not to leave until we arrive there; perhaps Government might induce him.

A.—Government of course cannot induce him as you know Sir Chimanlal is a busy man. All I can say is that I will talk the matter over with you afterwards and I will see what I can do or what His Excellency can do. I can say nothing more. In fact your Chairman should be able to do as much as anybody else but if I can do anything, my services are at your disposal.

Sir Frederick Hopkinson.—At whose instance the dredger "Kalu" was purchased?

A.—It was at the instance of Sir George Buchanan.

Q.—Where it was to dredge?

A.—It was to dredge over the East Colaba Section originally.

Q.—Has there been a project estimate for that reclamation?

A.—Yes.

Q.—Is there a detailed estimate?

A.—Yes, there is a detailed project estimate.

Q.—When was it decided to do the East Colaba Reclamation?

A.—Both at the same time. I may not be quite accurate but I will correct it if I am wrong.

Q.—East Colaba Reclamation seems to be a very modest thing and does not seem to have come in the forefront.

A.—A part of the land was to be sold to the military, but it has been given up.

Q.—Why was "Kalu" purchased?

A.—For the East Colaba Reclamation.

Q.—Have you any plans for this East Colaba Reclamation?

A.—Yes, detailed estimates.

Q.—Was it by a Resolution of the Government that it was to be done?

A.—Exactly the same as the other.

Q.—It costs £60,000?

A.—Yes, about 7 or 8 lakhs of rupees.

Q.—Is that money all lost?

A.—A certain amount of land was purchased which can be resold.

Q.—It is included in that 7 or 8 lakhs?

A.—I think it is $7\frac{1}{2}$ lakhs out of which the land is worth 5 lakhs.

Q.—There must have been a report?

A.—Yes. There is a detailed project estimate which will be sent to you.

Q.—We hear of "Kalu" dredging for the Back Bay Reclamation?

A.—No, it came on the scene very much later. If you like I can give you a short history; it is all given in the papers. You will find a most useful recapitulation of the history in the report which Sir George Buchanan sent to this Government. It is dated 15th December 1924. It is the last report and you find the whole recapitulation there. You will find this all in the printed correspondence. There was another letter from Sir George Buchanan definitely suggesting the programme of dredging with the "Kalu" in the Back Bay and "Sir George Lloyd" in the Harbour.

Q.—Can you tell us when the Government of India were informed of the increase of estimates from 367 to 702 lakhs?

A.—I do not think we ever informed the Government of India officially. The first statement was made by Mr. Monie to the Indian Merchants Chamber in July followed by a speech by Sir George Lloyd in August.

Q.—I presume the Government of India was informed about 367 lakhs estimate but not of 702 lakhs officially?

A.—The whole estimate went with Sir George Buchanan's report.

Q.—Would it be possible, you think, for the Government of Bombay to reclaim this area so far as the surface only is concerned and leave the rest to the Bombay Municipality to develop by making drains and roads, etc.?

A.—Storm water drains will have to be finished before the reclamation. I understand you want my opinion.

Q.—Assuming the Government of Bombay fill the reclamation area up to surface level and the development, *i.e.*, making of roads, sewers, etc., be left to the Municipality of Bombay to finish?

A.—That would require a considerable amount of discussion between the two bodies as to what they would pay the Government of Bombay.

Mr. Billimoria.—A transaction of that sort can be considered?

A.—I do not know whether it will be at all possible.

Q.—But the Bombay Municipality stand to gain considerably?

A.—A great deal indeed but I should not like to commit the Government in any way.

Chairman.—If Government desired to minimise the expenditure on reclamation, should not the development of the land be left to the Municipality?

A.—And what would the Municipality get in return.

Q.—Taxes?

A.—I cannot speak for the Municipality as to what they would think.

Q.—The Municipality will get all the ratable value of this land which they will develop?

A.—I should not like to express an opinion. It is for the Municipality to say.

Sir Frederick Hopkinson.—I suggest this idea?

A.—I had this idea, it occurred to me very often as to whether it would be quite fair to Government and the tax-payers generally that the Municipality should get all the ratable value for nothing. I have postponed consideration of that point considering that we have not got the reclamation yet.

Q.—Well I suggest it should be?

A.—It will be but I may tell you it is not so easy as you think. There are constitutional points involved and the whole law is to be considered.

Q.—Whether the idea will germinate or not will depend on the efforts of the Bombay Government?

A.—Do you not consider that it is premature?

Q.—I think it is essential it should be considered at once because it is going to make a difference in your capital amount?

A.—Yes it will.

Mr. Billimoria.—The Municipality, in your opinion, constituted as it is at present with Swaragist majority has the slightest chance of entertaining such a proposition?

A.—I would rather not express an opinion. My position, as a Member of Government, is difficult. I have been a President of the Municipality but I cannot say anything.

Q.—Placed as the Municipality is, do you think they would like to do such a thing?

A.—I would not rather answer this question. I can only say they are a reasonable body and will consider this question fully.

Chairman.—It is going to have a very material effect on the total cost. The development charges will be very heavy?

A.—It will depend upon how many buildings are to be built and in how many years the income will increase. I think that is a very good suggestion and should be given very serious consideration.

Q.—I have suggested to Sir Lawless Hepper to make enquiries as soon as possible to find out quarries nearer to the site of the works.

A.—It has already been done. Anything you may have told Sir Lawless Hepper will be given the most careful consideration.

Sir Frederick Hoopkinson.—I have advised him this morning not to accept any tenders that he may receive?

A.—We are not going to accept any tenders.

Q.—Do not accept any tender on that specification at any time. The specification requires alteration?

A.—This specification was drawn up by Sir Alexander Gibbs and we paid Sir Alexander Gibbs 100 guineas.

When our engineers drew up a specification, I was most anxious to get the best specification I could and I showed that specification to Sir Alexander Gibbs but he did not approve of it. We took Sir Alexander Gibbs' advice after we had dispensed with the service of Sir George Buchanan. This specification was therefore shown to him—I have got a report on it—but he did not approve it. In the circumstances I thought the best thing was to ask him to draw up a specification himself and it was done either by himself or under his instructions. The specification was drawn up by his firm.

Q.—I advise you most strongly not to accept any tenders on that specification. I am quite sure the prices will be unreasonably high. There is so much risk put on the contractor under these specifications so that you will not get a reasonable price?

A.—I must give that much credit to Sir Alexander Gibbs that he complained that the original specification was too strict and he wanted to know why the specification was so strict. I think our engineers informed him that that was the usual thing in India when specifications are drawn up.

Q.—Do not accept any tenders now?

A.—Well Sir we are anxiously awaiting your Committee's report as to the future before we take any action. As you are a Committee appointed by the Government of India, your report will go to the Government of India who will forward it to us as soon as possible. I can only urge upon you to give us an *ad interim* report as to the future operations as soon as possible because we want your advice.

Q.—Is there any information available as to the extent of the enquiries made by Sir George Buchanan in 1919? Does any one know whether he had much staff here?

A.—I have not seen anything on record whether he had staff or whether he was single handed.

Q.—I asked Sir Lawless Hepper referring to his first report in 1921 in which there is a list of the works he was in charge of as the Director of Development, whether it is possible for any one to have control of such an enormous scheme running to something like 22½ million sterling. I suggested it to him that it is Nepoleanic and none else but Nepolian could have done it. What I want to suggest to you is that Government could never have expected a successful issue out of all this under the arrangement proposed in the Development Department. You had one Director and one Deputy Director, that is all.

A.—May I point out that the Legislative Council was of opinion that we could do without the Deputy Director or the Director.

Q.—Who is going to do the work?

A.—The Legislative Council are of opinion that we are over-staffed.

Q.—That does not disagree with my views that you want some more heads?

A.—They are very strongly of opinion that we are top heavy, that we have got too many men at the top.

Q.—I will give you my opinion. I told Sir Lawless Hepper that he was in an absolutely impossible position? No one in his position could do it?

A.—I am glad for your expression of opinion but the Legislative Council were strongly against it.

Q.—We have a number of charges brought against the officials of the Directorate by Mr. Nariman. They have been dealt with this morning and what the Committee would like to know as to what steps, if the Government are prepared to take any steps, they would take to make Mr. Nariman prove his words when he has gone into the open and has given specific instances of corruption against the officers of the Directorate. We want to know what the Government is going to make Mr. Nariman prove allegations?

A.—Mr. Nariman had a chance to appear before you and he made those allegations. The officers of the Department also appeared before you this morning and showed you all the facts, what was the result of that, I do not know because I was not present. What do you think Government ought to do.

Q.—I am stating it as my personal opinion. These charges ought to be proved in some legal way?

A.—One or two of these charges have been examined by me personally when they were made not so openly as they have been made now and I found them to be groundless. In one case I had to give a reply in Council to Mr. Nariman and he was not satisfied with that reply and has repeated them here. I hear that the officers have demanded that they should be allowed to prosecute him. I would like an expression of an opinion whether they should get the sanction of the Government if ever they apply? What is the reply of the Committee?

Mr. Billimoria.—The reply we give is that as a Committee we have no powers to give any permission to anybody but that any officer concerned is at liberty to take any action he chooses.

A.—That is your opinion, I want the opinion of the Chairman.

Mr. Billimoria.—I think it was my suggestion and the Committee accepted it.

Sir Frederick Hopkinson.—My opinion is that they ought to be proved or disapproved by Government in a court of law. I believe Government have gone into them and found them to be untrue?

A.—All those that I have examined, I found to be untrue.

Q.—A large number of allegations seem to be untrue but what about the remainder? They seem to be personal allegations of corruption and as such can only be dealt with in a court of law?

A.—We will take down whatever opinion you may give us. You heard the officers yourself and you heard the allegations. I have only read the written statement but one of the charges that Mr. Nariman has repeated was investigated and proved to be untrue. I believe all the other charges will prove to be untrue.

Chairman.—So far as the Committee is concerned, it is not our business. We may make a recommendation after the whole enquiry is over.

A.—I want to know what I am to take down.

Q.—If you wish to note down the opinion of Sir Frederick Hopkinson, you may do so.

Sir Frederick Hopkinson.—We have had no time to discuss these but it is my personal opinion that Mr. Nariman should be made either to prove or have these charges disapproved.

A.—The officers have disapproved some of the charges. It is clear that when charges are made against officers, it is the duty of Government to have them investigated. These charges have been made before the Committee in the course of their enquiry. You will oblige us by expressing your opinion. Some charges have been made on which Mr. Nariman was not examined by you because they related to other parts of development. I find that these charges have been printed in newspapers; the whole of Mr. Nariman's statement appeared in the press. I want to know from you authoritatively just now whether you are going to allow the officers of Government to repudiate those charges.

Chairman.—It does not concern us.

Honourable Mr. Cowasji Jehangir.—They have appeared in the press through the instrumentality of this Committee and the officers of Government have not been given an opportunity to repudiate them. You refuse to do so?

Chairman.—We have not refused them the opportunity of repudiating those charges but we have to attend to our own work. We have not asked a single question so far as those charges are concerned which do not come under our terms of reference.

Honourable Mr. Cowasji Jehangir.—Then in your report you will delete all those charges which have been made against officers of Government which do not concern you.

Chairman.—That is so.

Honourable Mr. Cowasji Jehangir.—And you have definitely refused the officers of Government to hear them on those points.

Chairman.—Yes, and also Mr. Nariman.

Honourable Mr. Cowasji Jehangir.—Except on one point on which you have also heard the officers.

Chairman.—Yes.

Honourable Mr. Cowasji Jehangir.—You desire, Sir Frederick Hopkinson, that Government should proceed further in this matter. You say that, after the very full investigation that you have had of all these points before you this morning, Government should further investigate them.

Sir Frederick Hopkinson.—I think they should proceed against the maker if the Government are satisfied that they are untrue.

Honourable Mr. Cowasji Jehangir.—We are satisfied that those points are untrue and I am satisfied that the points that I have investigated up to now are untrue. Then I take it that you express an opinion that Government should allow the officers sanction to prosecute Mr. Nariman.

Chairman.—That is the opinion of one Member.

Honourable Mr. Cowasji Jehangir.—I want the opinion of the Committee.

Chairman.—We cannot give an opinion on that point but we leave the question open for Government and the officials concerned to do whatever they like.

Honourable Mr. Cowasji Jehangir.—Then Mr. Nariman had no privilege to make those allegations, he was not a privileged party in making defamatory statements.

Chairman.—I believe it is a purely legal matter.

Sir Frederick Hopkinson.—But that privilege does not cover malicious statements. There is a difference between defamatory and malicious.

Honourable Mr. Cowasji Jehangir.—Then I want your opinion.

Sir Frederick Hopkinson.—I am of opinion that if these statements were defamatory, Mr. Nariman should be prosecuted.

Mr. Billimoria.—It is open to any officer concerned to take any action he chooses against Mr. Nariman. We are not a judicial court and therefore we do not want to express an opinion on the legal points. That is my opinion.

Chairman.—It will be done by the Committee as a whole later. I express no opinion except that I say we are not concerned.

Honourable Mr. Cowasji Jehangir.—I ask this because if an officer desires to proceed against Mr. Nariman, he has to get the sanction of the Government of Bombay and I want your opinion since you have been appointed by the Government of India. That is of course if a contingency arises.

Sir Frederick Hopkinson.—Were the annual reports made by the Development Directorate the only means of communication with the public?

A.—There are other methods of communication, by press communiques, by press notes through the Director of Information.

Q.—Were those used to communicate the progress of the Back Bay Reclamation?

A.—No, I do not think so.

Q.—So that I may take it that the annual report was the only means for communicating the results?

A.—No, also the Legislative Council through questions and answers and discussions.

Q.—Can we see a copy of the agreement between the Government of Bombay and the Government of India with regard to the disposal of block No. 8 because following figures have been given to me as to the area and the amount. I want to know the exact figure.

A.—I think it is all in the correspondence.

(Secretary said he had all these papers).

Honourable Mr. Cowasji Jehangir.—Sir, as I have already stated, Mr. Nariman has in his written statement informed you that I gave two misleading answers to questions put to me in Council. The first question he refers to dealt with original and revised estimates of all schemes under the Development Department. The printed reply on the 15th October 1924 stated that the original and final estimate of the Back Bay Reclamation Project was Rs. 702 lakhs. I have already, in the course of this evidence, quoted from a report from Sir George Buchanan dated 11th February 1922 showing that his estimate of Rs. 367 lakhs was the estimate on which administrative sanction was given, and the estimate of Rs. 702 lakhs was the first detailed estimate. In answering supplementary questions on that occasion I pointed out to Mr. Nariman that he was confusing Sir George Buchanan's estimate with the detailed estimate, and I would refer you, Sir, to the supplementary questions and answers.

The second instance quoted by Mr. Nariman refers to the appointment of Messrs. Meik and Buchanan. He states that on two occasions I gave two different dates. On the 13th of March 1924, I had occasion in Council to explain the agreement between Messrs. Meik and Buchanan and the Secretary of State and stated that the Governor in Council agreed to the agreement on the 31st of March 1920; but it was not actually signed until March 1921. During the last budget session (February-March 1926), I gave a history of the inception of the scheme and explained that Sir George Buchanan was asked to prepare a report on the 30th of May 1919. It will thus be seen that Sir George Buchanan was first asked to prepare a report for which he was paid Rs. 20,000, and when the scheme had been sanctioned, his firm was employed as Engineers to the project. I now find that Mr. Nariman did not know that Sir George Buchanan was employed on two separate occasions, and has been misled into accusing me of having given two separate dates. I can only express surprise that a man of Mr. Nariman's ability and experience did not understand this till to-day. I do not accuse Mr. Nariman of having made these statements deliberately.

Q.—You have no remarks to make about Simons & Co.'s representative?

A.—I only want to bring to your attention the fact that the Managing Director of Simons, Mr. McMurray, was here the cold weather before the dredging started and was here again during the first season of dredging. Sir George Buchanan was in constant touch with the Managing Director of Simons throughout the operations, took their advice at every stage, and there was no time at which we did not ask Sir George Buchanan to get their

opinion and see what they could do. I saw one witness was under the impression that we never consulted the makers throughout. It is wrong. The Managing Director was here seeing the dredger working. He was also present at a conference in 1922 when the point for discussion was the material in the harbour.

Q.—At that time the dredger had been started?

A.—Yes.

Mr. Billimoria.—Before you became a member of Government you were a very active and influential member of public bodies in Bombay.

A.—I do not know that.

Q.—You have intimate knowledge of conditions of life in this city?

A.—I hope so. Whatever I know is at your disposal.

Q.—You submitted a written statement to a Committee in 1913.

A.—Yes, I know it, Sir.

Q.—In that statement you did not express views in favour of the reclamations?

A.—I did not, Sir.

Q.—Do you still adhere to that or has your opinion changed subsequently?

A.—I wrote a statement as evidence before Sir Claude Hill's Committee of 1913 or 1914, which Mr. Manu Subedar has done me the honour of reprinting in the minority report. I think he has printed the whole of it. At that time I was strongly of opinion that no reclamation was necessary in Bombay, and I pointed out how Bombay could expand. I also pointed out at that time what buildings Government could acquire in the Fort for their own purposes. That was in 1914. I never had a chance of expressing an opinion when the reclamation became an accomplished fact. I was not a member of the Legislative Council. I heard about the reclamation just as the ordinary man in the street. It is rather difficult for me to say what I would have said then. I have to take myself back to the atmosphere of 1919 and try and express an opinion as to what I would have said if I had been called upon to do so, considering the strong opinion I held in 1914. You will realise that you are asking me a difficult question as to what I would have said in 1919. When I look upon the land values in Bombay at that time, when prices of land in Hornby Road went up to Rs. 2,000 a square yard, when people wanting shops paid up to a lakh of rupees as puggree to get into a shop, when the public men of Bombay were clamouring that Government should do something to relieve this congestion in the Fort, when business circles complained that trade was being hampered on account of the want of accommodation, I very much doubt whether I should have protested strongly against the reclamation, but looking on it now, of course it is a different matter. In 1914 it was different, in 1919 it was different, in 1926 it is different and I trust it will be a different matter in 1936.

Q.—Then you think there was an urgent and immediate necessity in 1919?

A.—No, I will not agree with that. I am expressing an opinion in my private capacity and not as a member of Government. I do not say there was an urgent necessity for the reclamation. I won't use the word 'urgent'. I am prepared to say there was a necessity. To say there was immediate and urgent necessity is an exaggeration.

Q.—But that was the time when land was required more than any other time?

A.—I quite agree. If ever there was a time when Government should have launched upon a reclamation, it was certainly in 1919. Whether the circumstances were such that they would tempt anybody to rush into it is another matter. But if there was any time in the history of Bombay when a reclamation was necessary it was in 1919.

Sir Frederick Hopkinson.—Had it gone favourably in 1919 and completed in 1927 or 1928 for Rs. 702 lakhs, do you think there would have been an outcry?

A.—There would have been a profit.

Q.—I am assuming now that the thing would have been done in a sensible business like way, that you would begin at the Colaba end, you will finish an area such as block 8 and hand it over to the Military shortly after it was finished, then you would go on to No. 7 and gradually all the way through to block 1, which means your capital account would have been reduced enormously and your land would have been available for sale soon after it was reclaimed.

A.—I shall show you, Sir, some forecasts that were worked out by the Department. I do not know whether it was brought to your attention. I shall give you an idea of it. A forecast was worked on the 5th July 1922. With the detailed estimate as sanctioned it showed, selling land at Rs. 40 in the first year, Rs. 45 in the second and Rs. 50 in the third year, the profit would have been something like $3\frac{1}{2}$ crores.

Q.—So that the profits have not been realised owing to human agency?

A.—It is entirely due to the dredger. If that dredger had given 2,000 cubic yards of stuff and had been able to work the number of hours stipulated by Sir George Buchanan I venture to suggest there would have been a profit. When I had the last forecast worked out after I took charge, it is called Nixon's forecast, (It was worked on 25th

January 1924), I worked out the land would cost Rs. 28 a square yard even if you did not sell a single square yard of land until the whole reclamation was finished. Counting interest we could have done it at Rs. 28 per square yard. When I made my speech in 1924, I had not the remotest idea the dredger was going to fail. And the first report I got after having made that speech was by Sir George Buchanan, which told me that we were doing satisfactorily. It was at the end of the year the shock came and then Sir George Buchanan assured us nothing was wrong.

Q.—When you made that statement in Council I take it you had the report of Sir George Buchanan in February?

A.—I made that speech even without that report. I got that report a few days after I made the speech.

Mr. Billimoria.—Coming to the whole question again, assuming there was a necessity for reclamation, do you think there was a neeessity for 1,145 acres of land?

A.—All would depend upon the figures that would be placed before me. In 1919 conditions were different from what they are now. I really do not know what I would have thought in 1919.

Chairman.—Then your Department has been accused of deliberately withholding information from the public. Has there been any attempt on the part of your Department at any stage or any time to withhold information from the public?

A.—We have tried our best to give all information and my supplementary answers are a proof of the same. All I can say is that at the end of the first year Sir George Buchanan assured me, assured His Excellency and assured the Finance Member that the figures should not be taken into calculation, that it was not a trial of any sort, that it was not doing him justice or the dredger justice and we would be doing both of them a lot of injustice if we base our calculations on the figures. Then we said the best thing was to wait until the next year, and in the meantime the Advisory Committee had been changed into a Special Committee. That Committee was appointed on a resolution by Mr. Lalji Naranji. In July as soon as we got the reports we sent the figures immediately to the Committee. Even then we did not know what the forecast would be. Even at the end of the second year in July I did not know what it really meant in loss. As soon as we got the dredging results we sent them to the Committee and as soon as the Committee's report came out it went from the printing press to the newspapers.

Q.—There is no reason why the dredging results should not have been known definitely?

A.—I am not an Engineer. All I can say is actual dredging results were given at the end of the working season.

Sir Frederick Hopkinson.—The dredger had not been to make a reclamation. It was built to dredge in the harbour. What happened to the stuff after it left the dredger was no concern of it. Whether that increased or decreased or was lost altogether is no fault of the dredger.

A.—It is somebody's fault. We do not get the stuff. That is all I am concerned with. I do not complain about the dredger. I am told the dredger is good. That according to the specification it has turned out as well as a machine can. It can never do its work as specified. We lost the stuff for the first two years. Sir George Buchanan's attention was drawn to it. After it had been sealed up he wrote and asked us to seal it up. All I say is, the dredger may be a first class machine, the dredger may be up to the specification, but whatever it is the dredger has not given us the stuff on the reclamation area and that is all I am concerned with.

Q.—Then you are accused of having misled Honourable Members of Council who complained that Government did not take them into confidence and statements have been made in Council which are not true. For instance the speech you made in 1924?

A.—I shall explain it. I did not have the first report of Sir George Buchanan at the time of the speech. That report said work was getting on satisfactorily. And there is not the shadow of a doubt that anybody would have made the same statement with the forecast before him then. We did not know anything about the dredger. My speech was confirmed by the report that I received at the end of March. He said the work of dredging was going on satisfactorily. You may read the report yourself. It is dated 14th February 1924.

Q.—Is it usual for a member of Government to consult his colleagues?

A.—Not always. He consults the Governor and in a matter like this he consults always the Finance Member. The Governor, the Finance Member and the Member in charge are the three persons who are seriously concerned.

Q.—I take it that you did exercise all reasonable care and prudence in the discharge of your duties as a responsible member of Government and the charges made against you are absolutely untrue?

A.—I hope so.

Q.—With regard to the unsatisfactory outturn of the dredgers you are not responsible?

A.—I hope not.

Q.—The huge failure is due to neglect or to insufficient output?

A.—Entirely to insufficient output.

Q.—Were any figures of costs of reclamation supplied to you?

A.—Yes, these forecasts. They are based on the 702 lakhs estimate.

Q.—In that you did not take into account interest?

A.—Yes. Every bit of interest is taken into account.

Q.—When Mr. Nariman made certain accusations in Council you gave him a fair opportunity of having a judicial enquiry?

A.—I can only refer to the speech I made in the Legislative Council in reply to him. I begged him to give instances. I promised I would investigate, and if I found any officer guilty I promised to have him dismissed on behalf of Government. If he was not prepared to give instances in open Council I was prepared to hear him privately. I was prepared to give him every opportunity to tell me in confidence as other members do. I never heard a word from Mr. Nariman.

Q.—He never availed himself of this opportunity?

A.—He did not. Then Government made an offer to him which was that they would have a Judge appointed to listen to his accusations and to investigate and that all the records which were relevant to the case would be placed before the Judge and I offered to do all I could to see that justice was done, and that it would be done in private and there would be no question of defamation, no question of libel. He could have made any accusation he chose. All the documents would be placed before the Judge. And on flimsy grounds he refused that. Ultimately I had to issue the whole of the Government's letter to him in the form of a press note. I could do no more.

Q.—He refused it on the ground that it was not a judicial inquiry, but it was an inquiry presided over by a Judge.

A.—Mr. Nariman would have refused a Royal Commission at the time.

I gave him every opportunity. I was prepared to give him a Judge who had the fullest confidence of the public of Bombay. He could have brought his witnesses and he could have proved every one of his accusations and I can only refer you to the press note issued, and I ask you to judge whether he was the accused person on those terms. I will ask you to read that letter we wrote to him and the reply we received, and say whether he was the accused person, whether we did not promise him every protection and personally I promised him every protection in Council. I was more anxious than he was that he should prove something because I heard rumours and I could not believe them and wished somebody would prove something to me, and the best test of my *bonâ fides* is this, Sir, that one member of the Legislative Council did bring some accusations. I investigated them. I found they were wrong. There was one point only that was correct, and that was that a contractor had committed a very serious offence in 1912 and had been convicted to $2\frac{1}{2}$ years' imprisonment. I found that statement was correct. I stopped that contractor from getting any more contracts, because I thought it was only reasonable that a contractor who had committed a serious crime should not be a Government contractor.

Q.—Therefore you had no right to add to his punishment.

A.—I regret I cannot agree. I think we have a right to expect that our contractors are not men convicted of very serious offences. I was told that the contractor had done his work most satisfactorily. I could see from all the tenders that he got fair rates and was not paid anything above the ordinary rates. That was the only fact that was true in the statement I received.

Q.—You never had any desire or intention to mislead the House or the public?

A.—Not the slightest.

Q.—Sir Lawless Hepper referred to a conference with Government, in which the General Member or the Governor was consulted and all the facts were placed before Government. Directly after that did you take necessary or immediate steps?

A.—I think it was in April 1925 or May 1925. We decided to send a strong letter to Sir George Buchanan and followed it up by getting rid of him.

Q.—You have placed at the disposal of the Committee all relevant documents?

A.—I have given instructions that every bit of paper should be given to you or anything that you would like to see. If anything is not here now we will supply it later on, and you can take it from us we are trying to produce everything we can find.

Q.—It has been suggested here certain consignments were sent out to this country in the name of His Excellency the Governor bearing the name " Sir George Lloyd "?

A.—I could get no confirmation of that rumour. Supposing it is true, do you mean to tell me, Sir, that every manufacturer in England knows the difference between the

Government of Bombay and the Governor of Bombay? Instead of saying "The Government of Bombay" he says "The Governor of Bombay" and I may tell you the people in England are not all aware of the constitution of the Government of Bombay.

Q.—Is it not a fact, Mr. Cowasji, that the dredger is also named "Sir George Lloyd" and the dredger when it came with the relative parts of the machinery had the cases thus marked, "Sir George Lloyd"? So Hepper told me?

A.—Well, I do not know that. It may be so. (Sir F. Hopkinson: There is no other way to do it). It may be that the spare parts were marked "Sir George Lloyd". It may be. It is quite possible.

Q.—When I gave that explanation, Mr. Nariman called it ingenious. Do you suppose it is ingenious?

A.—Any reasonable explanation which did not suit Mr. Nariman, he will call ingenious.

Chairman.—I thank you for the very candid manner in which you have placed all the facts before us.

ADDENDA.

(I.)

Note by the Director of Development on the Back Bay Reclamation Scheme with special reference to the Causes of the Anticipated Excess over the Sanctioned Project Estimate.

The Government of Bombay, on the 30th May, 1919, asked Sir George Buchanan to prepare a report on the Back Bay Reclamation Scheme, the terms of reference being :—

" (1) To examine and report on the Scheme prepared by Mr. Kidd of Messrs. Lowther, Kidd and Co. for the Reclamation of 1,145 acres in Back Bay, Bombay (known as the 1912 project) or any portion thereof which Government may thereafter designate.

The scheme comprises :—

" (*a*) The construction of a sea-wall.

" (*b*) Filling in within the area enclosed by the sea wall by means of dredging in the harbour on the east side of the Colaba Peninsula and pumping the material across the narrow neck at various points in the Back Bay.

" (*c*) Covering with a layer of moorum the land so reclaimed.

" (2) A specific opinion is required on the following points :—

" (i) The practicability of the scheme from the engineering point of view :

" (ii) The suitability of the type of wall proposed or alternative suggestions for better types;

" (iii) The suitability of the proposed method of reclamation by means of dredging or alternative proposals for same.

" (3) Mr. Kidd in his project of 1912 gave a general estimate for the above but unaccompanied by details of cost of dredgers and other plant. A revised estimate is required for the whole of the scheme giving details, showing :—

" (*a*) Cost of dredging plant;

" (*b*) Cost of dredging;

" (*c*) Cost of sea-wall, along with the price of plant in connection with the same;

" (*d*) Cost of moorum filling and plant required.

" (4) A programme of construction is required along with an opinion as to the order in which the work should be executed and the time within which the various sections could be completed from the date of the order to begin the work.

" The question whether the entire work should be given out as one complete contract or divided up into a number of small contracts may also be considered and whether it might not be advisable to carry out some items of the project or even the whole of it departmentally.

" (5) A separate report and estimate on above lines is required for the Reclamation of the east of the peninsula from Pilot Pier to Sassoon Dock, known as the East Colaba Project, and an opinion as to whether it could be carried out by dredging plant already in Bombay."

2. Messrs. Lowther, Kidd & Co. had carried out an elaborate survey in 1912 to ascertain the extent and character of the material available in the harbour and recorded the results in paragraphs 6, 7 and 8 of their report dated 3rd August, 1912, as follows :—

" 6. Drawing No. 5 shows the results in detail of this part of our investigation. A system of boring by hydraulic tubes was devised which proved to be perfectly reliable as well as rapid in action. 1,314 borings were sunk into the sea bed, of which the results of 1,159 are recorded on this drawing. These borings were in all cases sunk to the hard bottom—Rock or Moorum—or, where such a bottom was not found at a higher level, to the depth of 70 feet—and over—below low water level of ordinary spring Tides.

" 7. The character of the deposit was almost uniformly similar throughout, *viz.*, silt overlying a deep bed of blue clay. The silt is of recent formation—speaking geologically—but the clay is an old deposit, and indubitable evidence of its having at some time been above sea level is afforded by the fact that it contains many trunks and branches of trees. For the purpose of filling and making

up land the mud is sufficiently suitable, and the clay is eminently so. With good arrangements for draining out the water during construction the mud will make very good land after the lapse of a sufficient interval for drying. The clay, which is stiff and unctuous, hardens into perfectly solid ground in a very short time. As far as possible in course of execution of the works the clay would be preferred, not only because of its greater suitability for making land, but also because for dredging purposes its stiffer and more tangible character enables a higher percentage of solid material to be transported by the pumps.

" 8. In brief it has been completely established that there is available more than three times the quantity of material required, all of it suitable for making up land, and more than half of it eminently suitable both for this purpose and for economical transportation to the site."

They recommended that the reclamation should be carried out by suction dredging, and stated (in paragraph 22 of their report) " *The machinery we would employ will be designed and guaranteed to effect the removal of* 2,000 *cubic yards of silt or blue clay per hour from a maximum depth of* 70 *feet below low water, and deliver it at any state of the tide to any part of the reclamation.*" No actual specification of the plant was given in their report.

3. Sir George Buchanan submitted his report in September 1919. He expressed the opinion that there was no doubt as to the practicability of the scheme from an engineering point of view. He recommended the adoption of a concrete wall superimposed (except for a length of 2,000 feet) on a rubble mound, with suitable block protection on the exposed side. As regards the proposed method of reclamation by dredging Sir George Buchanan stated in paragraph 29 (2) of his report :—

" There is an abundance of material in the harbour for the filling and it can be deposited in the area to be reclaimed by means of modern suction dredgers much cheaper than in any other way."

and he recommended the purchase of a cutter suction dredger the " Sir George Lloyd " designed for dredging to depths up to 70 feet below water level and to be capable of discharging at the rate of 2,000 cubic yards of *soft clay* per hour through a floating pipe line to a distance of 5,000 feet. An intermediate pumping station (the " Colaba ") was also provided to pump the material a further 5,000 feet, allowing for 10,000 feet in all, between the point at which the material was to be dredged, and the point of discharge. He stated that " the plant has been designed to deal with 25 million cubic yards in 5 years, working 170 days a year and 15 hours actual pumping a day, in two shifts. This is a conservative estimate and based on the possibilities of the dredger being unable to work through any part of the monsoon." Sir George Buchanan did not himself take any borings in the harbour, but he stated in paragraph 34 of his report :—

" On the assumption that Mr. Kidd's surveys and borings are correct, and I see no reason to doubt their accuracy as a great many borings were taken, I accept his conclusion both in respect to quality and quantity of material."

4. With his report Sir George Buchanan submitted an estimate of the cost of the scheme amounting to Rs. 367·61 lakhs, which was based on the assumption that the plant would dredge and deliver 5 million cubic yards of material per annum, and that the whole of the material dredged would be retained as filling in the area to be reclaimed. The Government of Bombay accepted Sir George Buchanan's recommendations, and, in their letter No. 10550 dated the 4th December 1919, informed the Government of India as follows :—

" On the technical aspects of the new scheme, the Governor in Council offers no opinion. He is fully prepared to accept Sir George Buchanan's carefully considered views on the practicability of the scheme from an engineering point of view on the type of wall required for the reclamation and on the method of reclamation."

The sanction of the Secretary of State to the scheme was received in May, 1920, and the order for the dredging plant was placed by the Director-General of Stores at the same time.

5. The Development Department was formed in November, 1920, and the preparation of a detailed project estimate was put in hand. This estimate amounted to Rs. 702·43 lakhs against Sir George Buchanan's estimate of Rs. 367·61 lakhs. The excess was due to the fact that, since Sir George Buchanan prepared his estimate, the prices of machinery, materials, fuel and labour had risen considerably. Also Sir George Buchanan's estimate had been based on exchange at Rs. 12 to the £, whereas, when the plant was imported, the rate was in the neighbourhood of Rs. 15 to the £. Moreover, insufficient provision had been made by Sir George Buchanan for the cost of the subsequent development of the reclaimed area in the way of

roads, storm water drainage, sewerage, lighting, etc. The detailed project estimate which was based on Sir George Buchanan's estimate of five million cubic yards of actual filling per annum, was sanctioned by the Government of Bombay under Government Resolution No. S. C. 1856 dated the 5th October, 1922. Work on the construction of the sea wall was commenced in the cold weather 1920-21. The dredger arrived in Bombay in March, 1922, and dredging operations in the harbour began in December, 1923. The actual dredging results, with the plant working in the harbour, during the three seasons it has been in use, are as shown below, the output, as estimated by Sir George Buchanan, being also given for purposes of comparison.

Season.	No. of pumping hours.	Quantity of material dredged as ascertained from soundings.		Actual filling as measured in Back Bay	
		per pumping hour.	per season	per pumping hour.	per season.
		Cub. yards.	Cub. yards.	Cub. yards.	Cub. yards.
As estimated by Sir George Buchanan	2,550	2,000	5,000,000	2,000	5,000,000
Actuals—					
1923-24	843	1,020	859,858	627	528,000
1924-25	1,473	856	1,261,986	462	680,438
1925-26	1,905	959	1,828,303	1,188	2,264,000

It is the very low output of actual filling which has been obtained, compared with that estimated by Sir George Buchanan, that is mainly responsible for the anticipated excess over the sanctioned project estimate. A comparative statement is attached to this note (Appendix A) showing, on the one hand, the provision against each of the main works heads of the sanctioned project estimate; and, on the other, the cost which it is now estimated will be incurred against each head, based on the dredging results of the season 1924-25. This is the statement supplied to all members of the Legislative Council during the Budget Session in March, 1926, and referred to by the Honourable Mr. Cowasjee Jehangir in his speech in making the demand for the grant for the Development Department. It will be seen that on the items other than those connected with dredged filling, a saving of over Rs. 35 lakhs is anticipated on the provision in the sanctioned project estimate. As regards dredging plant and dredged filling, there is an excess of over Rs. 28 lakhs under dredging plant, due to the provision of additional plant for dredging in Black Bay, but the main increase is under dredged filling. The comparison shows that, based on the results of actual filling in the season 1924-25, there would be likely to be an excess of Rs. 228 lakhs on this item.

6. The figures of dredging for the season 1924-26, given in the preceding paragraph, show 1,261,986 cubic yards dredged from the harbour and only 680,438 cubic yards retained in the reclamation, against Sir George Buchanan's estimate of 5 million cubic yards dredged and 5 million cubic yards retained. There was not only therefore a large deficiency in the amount of material dredged, when compared with the specified output of the dredger, but there was also a very considerable loss as between the material dredged and the material retained. It is proposed to deal with the question of annual output of material dredged in the first instance.

7. Sir George Buchanan provided in his specification of the dredger that it should be capable of dredging and delivering 2,000 cubic yards of *soft clay* per pumping hour. But he had accepted Mr. Kidd's description of the material available (see paragraph 3 above) as stated in paragraph 7 of Messrs. Lowther, Kidd and Co.'s report of 1912, *viz.*, that it consisted of silt and of *clay which was stiff and unctuous*. In the opinion of the Directorate Engineers it is the presence of this stiff clay which is the cause of the great reduction in output, and that although the dredger may be capable of an output of 2,000 cubic yards of *soft clay* per pumping hour, as Sir John Biles certified it to be at the official trials, it is not capable of that output when working in the material as it actually exists in the harbour. If Sir George Buchanan failed to appreciate the effect which the class of material to be dealt with would have on the output of the dredger as specified by him, it is ony fair to point out that Mr. Kidd did not anticipate trouble on this account, because, at the end of paragraph 7 of Messrs. Lowther, Kidd and Co.'s report of 1912, it is stated " The clay would be peferred . . . . . because for dredging purposes its stiffer and more tangible character enables a higher percentage of solid material to be transported by the pumps." At the same time in paragraph 22 of their report they stated their intention to employ machinery " designed and guaranteed to effect the removal of 2,000 cubic yards of silt or *blue clay* per hour."

8. But Mr. Kidd's estimate of the clay in the harbour as an ideal material for dredging purposes has proved to be incorrect. At page 982 of the " Engineering News Record ",

dated 15th December, 1925, there is an article dealing with a reclamation scheme of 50 million cubic yards being carried out by cutter suction dredgers in America. It is there emphasised how greatly the output of this type of dredging plant varies with the class of material. It is stated " *The output of one of the three dredgers used on this work varies from 2,000 to 50,000 cubic yards per 24-hour day, depending on the material being moved.*" This corresponds to a variation of from about 80 to 2,000 cubic yards per hour. Again it is recorded in the same article, " *Clay is difficult to remove from its bed and supply through the pipe line in quantities sufficient to give efficient results.*" In paragraph 22 of their report of August, 1912, Messrs. Lowther, Kidd & Co. refer in appreciative terms to the progress made in America and Canada in the development of suction dredging machinery and methods, and it is curious that they were not better informed on this point. Writing of the quality of material available, in paragraph 6 (*c*) of his report of 1926, Sir Alexander Gibb states " the nature of these materials is, in the main, either *too hard to obtain an economical output for the dredger* or too soft to provide satisfactory filling for the purpose of reclamation."

9. In his statement to the press Sir George Buchanan, referring to the Back Bay Reclamation, remarks, " dredging on such a large scale for such a purpose had not hitherto been attempted in any part of the world." This is hardly correct, for between 1909 and 1913 the Bombay Port Trust had carried out a reclamation scheme of 10 million cubic yards at Sewri, in Bombay Harbour, for a very similar purpose, using cutter suction dredgers of the same type as proposed by Sir George Buchanan for the Back Bay Reclamation. The actual results of the working of the Port Trust dredgers " Kalu " and " Jinga " are recorded in detail in a report stated to have been prepared by the late Mr. Messent, Chief Enginer of the Port Trust, and printed about the year 1915. Taking the results obtained by actual measurement, the figures are as follows :—

Dredger.	Quantity of material dredged brass.	Number of pumping hours.
" Kalu "	14,33,005	6,066
" Jinga "	21,91,754	5,841
Total ...	36,24,759	11,907

This is equivalent to an average output of 304 brass, or 1,126 cubic yards, per pumping hour. The material in which these dredgers were working is described in the report as " silt and clay," and there seems no reason to suppose that the material forming the bed of the harbour in one locality is greatly different from that in another.

10. The Port Trust dredgers were built by Messrs. Simons of Renfrew, to whom Sir George Buchanan recommended that the contract for the Back Bay Reclamation dredger should be given, and they were also specified to dredge and deliver 2,000 cubic yards of " soft clay " per hour. It is true that the dredger " Sir George Lloyd " is a larger machine (42 inches as against 39 inches) and is also more powerful. But, apart from the actual output, the " Sir George Lloyd " is specified to dredge from a depth of 70 feet below water level, and to be capable of discharging 2,000 cubic yards of soft clay per hour through a floating pipe line to a distance of 5,000 feet. The Port Trust dredgers on the other hand were specified to dredge from a depth of 30 feet only, below water level, and to discharge 2,000 cubic yards of soft clay per hour through a floating pipe line to a distance of 4,500 feet. The Port Trust reclamation had been in progress for three years when Messrs. Lowther, Kidd & Co.'s report of 1912 was written, and had of course been completed when Sir George Buchanan prepared his report in 1919. It is curious that neither of these authorities appear to have informed themselves of the practical experience of the Port Trust engineers before submitting their own proposals. The fact that the Mazagon-Sewri reclamation had been carried out by the Port Trust must have been known to Sir George Buchanan, although he makes only a passing reference to it in paragraph 42 of his report of September 1919. In paragraph 18 of that report however he quotes a letter from the Government of Bombay to the Government of India, dated 6th December 1911, in which in reply to a suggestion that " experience of reclamation by suction dredging is limited in Bombay," it is stated " *the large reclamations being carried out by the Port Trust afford exceptionally complete data for estimating work of this kind.*"

11. Sir George Buchanan was aware, from the description of the material given in Messrs. Lowther, Kidd & Co.'s report, which he accepted, that much of it was not what could be described as soft clay. Also, in paragraph 29 (3) of his report of September 1919, he mentions, " *the hard clay which lies below the mud.*" The inference is that he should have specified machinery capable of dealing with the actual material available;

or, in the alternative, if a specification on a "*soft clay*" basis was, for some reason or other, unavoidable, *he should, for purposes of his estimate, have made, as an ordinary precaution, a deduction from the specified output on account of the harder nature of much of the material to be dealt with, especially in view of the experience of the Port Trust.*

12. Sir George Buchanan, in his report to Government, dated 15th December, 1924, stated as follows:—

> "The 'Sir George Lloyd' and 'Colaba' were designed to discharge 2,000 cubic yards of soft clay per hour through 10,000 feet of 42-inch pipes. *Last season the material actually dealt with was not soft clay but silt and stiff clay,* with some sand stones, *which,* although much better than soft clay from the point of view of suitable material for reclamation, *is heavier and more difficult to pass through the pipe-line.* Until considerably more work has been done it is impossible to say of what the bulk of the material to be dredged will consist, but I think it is safe to assume that we shall not get the full output of 2,000 cubic yards per hour and that fact must be faced. If we get two-thirds of the total output we shall be doing well, and naturally the time required to complete the work and the cost of pumping will be increased."

It is a curious commentary on what has been written above, that Sir George Buchanan should, in December, 1924, have warned Government that his estimate of the output of the dredger was unlikely to be reached, stating as the reason that *the material actually being dealt with was not "soft clay," but material of the exact description given in paragraph 7 of Messrs. Lowther, Kidd & Co.'s report, viz., "silt and stiff clay."*

13. From the figures of annual output given in paragraph 5 above it will be seen that during the three seasons that the plant has been in use a total quantity of 3,950,147 cubic yards of material has been dredged from the harbour in 4,221 pumping hours, equivalent to an output of 936 cubic yards per pumping hour. The Chief Engineer is of opinion that with the material available in the harbour an average output of 1,000 cubic yards per pumping hour is not likely to be exceeded.

14. Apart from the output per pumping hour, the annual output depends on the number of pumping hours worked per season. Sir George Buchanan based his estimate on the assumption that the dredger would work 170 days a year, and 15 hours actual pumping a day, in two shifts, or a total of 2,550 pumping hours per annum. During the season 1925-26 the plant was worked double shift, and 1,905 pumping hours were worked. On account of bad weather 10 working days were lost, and 17 working days were lost owing to the necessity of putting the "Colaba" out of commission to enable certain stiffening of the hull to be undertaken in order to minimise the excessive vibration which had developed during pumping. Interruptions due to unfavourable weather conditions are likely to recur, but, taking the 17 days lost on account of the "Colaba" to be exceptional, it would appear that a normal season's work may be taken as 2,000 or 2,100 pumping hours. The Chief Engineer is of opinion, on the experience gained so far, that 2,000 pumping hours, at an average of 1,000 cubic yards per hour, or a total of 2 million cubic yards per annum, may be taken to be the best output of material dredged from the harbour that we are likely to obtain. *Mainly, therefore, because he neglected, in calculating what the dredger would actually do, to make allowance for the class of material to be dealt with, and partly because he over-estimated the number of pumping hours per season, Sir George Buchanan based his recommendations on an annual output of material dredged from the harbour about two-and-a-half times as great as the actual conditions in practice permit.*

15. There is then the question as to what proportion of the material dredged annually from the harbour should have been taken in calculating the actual quantity of consolidated filling produced in the reclamation. Sir George Buchanan based his estimate on the assumption that his output of 5 million cubic yards dredged from the harbour would produce 5 million cubic yards of consolidated filling. The Sub-Committee of the Advisory Committee, in paragraph 2 of their report, point out that in making this assumption *Sir George Buchanan made no allowance for shrinkage in drying out, or for losses as between the amount of material excavated in the harbour and the actual filling deposited in the reclamation.*

16. As to the first point, Sir George Buchanan, in his statement to the press, has refuted the suggestion that any allowance for shrinkage in drying out is necessary. He says that the material should bulk equally in the reclamation; and that, if there is any difference, he would expect the material dredged to bulk larger in the filled area. The Chief Engineer is of opinion that, whilst, in the case of the clay, it may be correct that there is no loss of bulk; in the case of the silt, which forms the larger proportion of the

material, he thinks that loss of bulk must occur as the material gradually dries out. We are not in a position to say, however, that loss of bulk has actually taken place from shrinkage; because, prior to the season 1925-26, the loss, as between the quantity of material dredged from the harbour, and retained in block 8, was mainly due to causes referred to in the next paragraph; and it is impossible to say how much, if any, of the loss was the result of reduction in bulk due to shrinkage. The question is one on which further expert opinion might be obtained, if thought necessary.

17. Coming to the second point, *Sir George Buchanan's design for the sea wall provides a concrete wall superimposed on a rubble mound, through which water, and consequently water with silt in suspension, can pass freely.* That Sir George Buchanan realised this condition is shown by the following quotation from his firm's letter to the Chief Engineer, dated 3rd June, 1922, eighteen months before the dredging started, "*In any case the sea must pass through the porous rubble wall for a long time to come.*" In January 1924, a month after the dredging commenced, at a meeting with Sir George Buchanan and Mr. Lewis (then Chief Engineer), the Director raised the question of the loss of silt through the sea wall that Mr. Lewis reported was occurring, and asked Sir George Buchanan if he would agree to steps being taken to stop it, but Sir George did not consider it necessary. Subsequently, under instructions from the Director, Mr. Lewis wrote to Sir George Buchanan in his letter No. 371, dated 24th January, 1924, as follows :—

> "In a discussion in Sir Lawless Hepper's room a few days ago it was suggested that the rubble mound should be lined on the inside with a layer of quarry spoil to prevent any leakage of dredged material. Would you agree to have this spoil placed in position from the present time onwards? If this can be done the disorganisation of the Quarries due to the curtailment of programme will be mitigated and use can be made of a by-product which otherwise has to be found room for with some difficulty and at some expense. I propose a thickness of 3 feet of spoil."

To which Sir George Buchanan replied :—

> "I am not in favour of beginning at present the lining of the rubble mound on the inside with Quarry spoil. I believe that later on when the reclamation towards the wall is more advanced, it may be desirable to put a lining on the inside up to H. W. Neap Tides only, but any small stuff deposited now would, I am afraid, be dispersed and washed away. In the matter of making immediate use of your quarry spoil I consider a great deal could be utilised in the reclamation of the area between the old foreshore line and the railway embankment, *vide* my letter dated 21st January."

Mr. Lewis again referred to this matter in a letter to Sir George Buchanan, dated 4th July, 1924, but no steps to render the sea wall impervious were taken, and a considerable quantity of material was lost in the season 1924-25 in consequence. Sir George Buchanan visited Bombay during this working season and must have observed the loss of material that was taking place, but he again took no steps to prevent it. After Sir George Buchanan's departure the Director decided, in consultation with the Chief Engineer, that action must be taken independently of Sir George Buchanan, in order to prevent any further loss in the following season 1925-26, and, with the sanction of Government, the work of tipping a heavy bank or moorum inside the sea wall was commenced in February, 1925, and completed in September, 1925.

18. Sir George Buchanan in his statement to the press has blamed the executive for not sealing the wall at an earlier date. But *Sir George Buchanan was the responsible engineer in charge of the work, which the Chief Engineer was to carry out under his instructions.* Writing in July 1922 Messrs. Meik & Buchanan stated as follows :—

> "We are afraid that there exists some misapprehension as to the relationship between the Chief Engineer and ourselves. . . . . The Chief Engineer has in his project estimate report called us the Consulting Engineers in which case he, as the Chief Engineer, would only consult us when he felt disposed to do so. *We interpret our agreement to mean that we are the actual responsible engineers.*"

It is clear therefore that Sir George Buchanan was in no doubt as to his responsibilities and powers. The loss of material was brought to his notice in writing more than once, and it was his business to give instructions to the Chief Engineer if he considered it necessary. It is quite possible that Sir George Buchanan considered that the silt was unsatisfactory material for purposes of reclamation, a view which is expressed by Sir Alexander Gibb in paragraph 6 (*c*) of his report of February, 1926. But whatever his reason, *having adopted a type of wall which would obviously permit the escape of much of the material dredged from the harbour, Sir George Buchanan should have made some allowance for this loss, and should not have based his calculations on the assumption that the whole of the material dredged from the harbour would be retained as filling.*

On the subject of losses generally, if he had studied the Port Trust records referred to in paragraph 9 above Sir George Buchanan could hardly have failed to note the significant fact that *the dredgers " Kalu " and " Jinga " actually dredged 39 lakhs brass of material from the harbour to complete the Mazagon-Sewri reclamation estimated to contain 29 lakhs brass only.*

19. During the season 1925-26, owing to the sealing of the wall, practically the whole of the material dredged has been retained in block 8. It remains to be seen whether the silt makes satisfactory filling or not. The Chief Engineer is of opinion that it will give better results than in the case of the Mazagon-Sewri reclamation, because it contains a small percentage of sand which helps the drying out process; and moreover the dredged material is deposited on the hard bottom of Back Bay, and not, as in the case of the Port Trust reclamation, on a foreshore consisting of 30 feet or so of soft mud.

20. Another factor controlling the output of the plant is the length of pipe line. Sir George Buchanan specified the " Sir George Lloyd " and " Colaba " to pump through 5,000 feet of pipe line each, or a total length of 10,000 feet. It appears, however, that the reclamation cannot be completed without this distance being substantially exceeded. The Chief Engineer has reported on this point that " *even if there had been no curtailment of the dredging area, only a comparatively limited area of the reclamation could have been filled with the length of pipe specified by Sir George Buchanan.*" The reason being, he states, that " experience has shown that at least 1,000 to 1,500 feet of line are required, in addition to the direct line between the dredger and the intermediate pumping station, to give the necessary flexibility to the pipe line to enable the dredger to swing across the cut. On account of the strong tides, it is necessary for the dredger to work in cuts running approximately North-East and South-West." Although the specified length of pipe line has had to be exceeded on certain occasions during the past three seasons, the effect on the output has probably been small compared with that produced by the class of material being dredged. It may, however, be a more important factor in the future.

21. In a letter dated 15th October, 1925, Messrs. Meik & Buchanan wrote and suggested the advisability of sealing the sea wall, the work, by that time, having been completed. A copy of their letter is attached to this note (Appendix B). *It contains a practical admission that the quality of material and length of pipe line are important factors in controlling the output of the plant; and expresses the opinion that the loss of material (which Sir George Buchanan ignored) " is quite as serious a matter as the low rate of output of the dredger.*"

22. Another reason why Sir George Buchanan's estimate has been found to be at fault is that referred to in paragraph 6 (*a*) of the report of the Advisory Committee, viz., that the whole of the material required cannot be obtained from the harbour, because the area which Sir George Buchanan proposed to dredge over has had to be curtailed to meet the reasonable objections of the Royal Indian Marine and the Bombay Port Trust. As a result, the balance of the material required has to be obtained from Back Bay, involving a further outlay of Rs. 28 lakhs on additional plant; besides increasing the dredging costs, because the material available in Back Bay, and the conditions generally, are such as result in lower output at higher unit cost, as compared with the plant working in the harbour. It may be doubted, however, if the position would have been materially different if the dredging area had not been restricted. To obtain the material from the northern portion of the original dredging area (the area which has been given up), it would have been necessary to lay a pipe line across the Island, either through the B. B. & C. I. Railway yard at Colaba, or down Ormiston Road. Sir George Buchanan appears to have underestimated the difficulty and cost of laying a pipe line in either position. In paragraph 14 (2) of his report, dated 15th December, 1924, he records certain conclusions arrived at, at a conference held by him in the Chief Engineer's office on 9th January, 1924, as follows :—

" *The proposed pipe line through the B. B. & C. I. Railway yard near Wodehouse bridge, or alternately down Ormiston Street, involves such an unusual amount of costly and difficult work, that all idea of a pipe line in that vicinity should be abandoned. Ample material for the reclamation can be obtained from the harbour and Back Bay combined, without dredging from the northern side of the harbour.*"

From this it would appear to be doubtful whether it would have been a practical proposition to dredge the material from the northern area in the harbour in any case. But the fact remains that the restriction of the area in the harbour from one cause or another, unforeseen by Sir George Buchanan, must have the effect of enhancing the cost of the scheme.

23. In paragraph 14 above a reference is made to the stiffening of the hull of the " Colaba " which resulted in the loss of 17 working days during the season 1925-26. The responsibility for the design of the dredging plant is a joint responsibility between the

Consulting Naval Architect to the India Office, Sir John Biles, and Messrs. Meik and Buchanan. In clause 1 (2) of the agreement with the latter firm it is laid down that the duties of the engineers include, *inter alia*, " *the approval in conference and in conjunction with the Consulting Naval Architect to the Secretary of State of the detailed drawings and specifications of the dredger and floating pipe line and the final inspection and supervision of tests and trials.*"

It appears that the working of the engines and pumps on the " Colaba " set up severe strains in the structure of the ship which eventually resulted in rivets being broken, engines becoming loose on the seating, etc., a state of affairs which allowed movement in various parts culminating in excessive vibration. So serious did this vibration become that the Chief Engineer and Naval Constructor of the Government Dockyard were called in to advise. The former in his report dated 11th November, 1925 stated : " *The vibration of this vessel is not entirely due to structural weakness and there is no doubt that it is aggravated by the defects of the main engine seating.*" But he also remarks " *examination of the main engine seating and bed plate showed that a number of rivets securing angle brackets have worked loose, etc.*" from which it seems probable that vibration due to structural weakness was the primary cause of the trouble. Moreover the Naval Constructor, in consultation with the Chief Engineer of the dockyard, *submitted proposals for stiffening the hull of the vessel which, he says,* " *aim to check the movement at its source.*" It may be added that the stiffening of the vessel was successful in checking the excessive vibration and, after the work had been done, the " Colaba " worked from 19th March, 1926 to the end of the season, 13th May, 1926, without interruption. It is true that during the last few days of the season there was some increase of vibration, due to loose rivets, etc., below the engine bed plate. It had not been possible to attend to these without lifting the engines, and time did not permit of this being done during the working season. The work will be undertaken during the monsoon of 1926, and it is reasonable to hope that no further trouble will occur.

24. The reports of the Government Dockyard authorities were forwarded, as soon as received, to Messrs. Meik and Buchanan, and they were asked to consult Sir John Biles and Messrs. Simons on the proposals, and to telegraph their views. Messrs. Meik and Buchanan, Sir John Biles and Messrs. Simons did not accept the conclusions of the Dockyard authorities, and stated that it was their unanimous opinion that the vibration of the " Colaba " was not caused by any structural defect, but by lack of uniformity in the load of the engines. This lack of uniformity is due to variations in the class of material in which the dredger is working, which results, in changes of condition as regards pressure or vacuum on the suction side of the " Colaba's " pump. A sea valve has been provided on the suction side of the pump, and both Sir John Biles and Messrs. Simons stated that the proper way to reduce the vibration was to open the sea valve when any vacuum showed in the pipe on the suction side of the pump ; or, as an alternative, to shift the " Colaba " nearer to the " Sir George Lloyd."

25. The Chief Engineer, to whom these opinions were communicated, stated that the proposal to operate the sea valve had already been tried, with the result that, instead of water being sucked into the pump, dredged material was being discharged through the valve and lost. Also that as the normal condition in the pipe was one of pressure, and a vacuum, when it occurred, was only momentary, the valve was ineffective for the purpose, because it took four men 15 or 20 minutes to open or close it. No fixed position of the valve, intermediate or otherwise, could compensate for the rapidly changing conditions due to variations of material, and the Chief Engineer doubted if even an automatic valve would be sufficiently quick in action to do so. As regards the suggestion to shift the " Colaba " nearer to the " Sir George Lloyd " the Chief Engineer reported that there was no other spot, except the dredged berth, in which the " Colaba " could be moored.

26. The stiffening of the hull of the " Colaba " was accordingly carried out in the Government Dockyard, and Sir John Biles and Messrs. Simons appear to have accepted the Chief Engineer's views as to the utility of the sea valve, for the former has now recommended the substitution of the present contrivance by an automatic valve specially designed by the latter to deal with the situation. It does no appear unreasonable to hold that the design of the " Colaba " was defective, and that either the hull of the vessel should have been of more substantial construction, or that more effective means should have been provided to compensate for the unequal loading of the engines. The excessive vibration of the " Colaba " has not so far affected the output of the plant except as regards the loss of 17 working days in the season 1925-26. There remains, however, the possibility, a remote one it is hoped, that there may be a recurrence of the trouble in future seasons.

27. From the foregoing notes it will be seen that had it been possible, as Sir George Buchanan assumed, to obtain the whole of the material by dredging from the harbour, and to complete the reclamation at the rate of 5 million cubic yards of consolidated filling per annum, the work would have been completed in five years, within the sanctioned project estimate of Rs. 702·43 lakhs. The actual annual cost of working the dredging plant is less than provided for in that estimate; but, owing to the deficiency of the output, the expenditure will have to be incurred over a longer period. From the foregoing examination of the case of the following conclusions appear to be justified :—

(1) Sir George Buchanan, knowing that much of the material to be dealt with was clay which was " stiff and unctuous " (a description which he accepted), and having available the full data dealing with the performances of Messrs. Simons' dredgers " Kalu " and " Jinga " in the Bombay harbour, was wanting in ordinary caution in assuming, for purposes of his estimate, that the dredger, " Sir George Lloyd," designed to dredge 2,000 cubic yards per pumping hour in " soft clay," would give that output when working in the material described in the report of Messrs. Lowther, Kidd & Co. as available in the harbour.

(2) Further, that owing to insufficient study or appreciation of the conditions as regards tides and weather at Colaba, he overestimated the number of hours of useful work which the plant would be able to perform per annum, and underestimated the length of pipe line required.

(3) That as a result of these initial errors he framed his estimate on the basis of an output of 5 million cubic yards of material dredged from the harbour per annum, whereas experience has shown that 2 million cubic yards is hardly likely to be exceeded.

(4) That Sir George Buchanan's estimate was further vitiated because he assumed that 5 million cubic yards of material dredged from the harbour would produce 5 million cubic yards of consolidated filling, making no allowance for losses which, with the type of wall designed by him, were inevitable; and which, in any case, the experience of the Port Trust should have warned him to expect.

(5) That his assumption that the whole of the material required could be obtained from harbour having proved to be incorrect, it has been necessary to supplement the dredging in the harbour by dredging in Back Bay, involving additional expenditure on plant, and higher working unit costs.

(6) That by a combination of the mistakes referred to above, Sir George Buchanan overestimated, to an extent which has proved disastrous, the vital figure on which the cost, and time for completion, of the whole scheme depended, **viz.**, the probable rate of progress, as measured in terms of consolidated filling per annum.

(7) And, finally, that Sir George Buchanan was jointly responsible with Sir John Biles for the design of the " Colaba " which has proved to be defective, on account of structural weakness and/or the want of efficient means to compensate for unequal loading of the engines.

APPENDIX A.

BACK BAY RECLAMATION SCHEME.

Comparison between cost of works as provided in the sanctioned project estimate, and as now estimated.

Item.	Description.	Provision in sanctioned project estimate.	Present estimated cost.
	1.—Works other than those connected with dredged filling.	Rs.	Rs.
I	Gantry	13,68,481	13,68,481
II	Sea wall on rubble mound	78,14,526	58,11,723
III	Mass concrete wall at Colaba	10,02,432	7,61,988
IV	Cross walls	19,40,400	2,79,566
V—A	Kandivlee quarry acquisition	1,50,000	5,52,222
V—B	Kandivlee quarry— Opening out quarry	18.26,300	17,98,230
V—C	Kandivlee quarry— Machinery and buildings...	27,59,498	27,46,685
VI—A	Marine Lines—Preparation of site	9,04,290	8,81,322
VI—B	Marine Lines—Machinery and buildings...	14,98,879	14,72,510
VII—A	Colaba—Preparation of site	1,75,174	3,20,048
VII—B	Colaba—Machinery and buildings...	9,03,313	9,80,106
VIII	Marine Lines—Colaba Railway	7,72,534	8,38,356
IX	Transport and rolling stock	24,05,448	21,48,964
XIII	Murum topping	31,36,712	31.36,712
XIV	Roads and lights	1,19,95,762	1,19,95,762
XV	Drains...	27,66,750	27,66,750
XVI	Storm-water drains	64,28,100	64,28,100
XIX	Unforeseen	10,00,000	10,00,000
	Total ...	4,88,48,599	4,52,87.525
	2.—Dredging plant and dredged filling.		
X	Dredging plant	1,34,04,860	1,62,47,737
XI	Laying shore pipe line	3,89,249	1,75,510
XII	Dredged filling	82,03,125*	3,10,22,985†
	Total ...	2,19,97,234	4,74,46,232

* Based on specified output of dredging plant. † Based on output obtained last season (1924–25).

APPENDIX B.

16, Victoria Street, Westminster,
London, S.W. 1.
15th October, 1925.

C. S. MEIK & BUCHANAN.

The Secretary to the Government of Bombay,
Development Department,
Bombay Castle, Bombay.

SIR,

Bombay Back Bay Reclamation Scheme.

In continuation of our letter, dated 24th September, acknowledging receipt of your letter S.B. 1291 of 20th August, on the subject of dredging operations, Sir George Buchanan has returned to London and we have discussed the matter fully with him and Mr. McMurray, the London representative of Messrs. Wm. Simons & Co., Ltd., who were the builders of the dredging plant.

2. The following are some of the conclusions arrived at :—

(1) The dredger " Sir George Lloyd " was designed to dredge 2,000 cubic yards of soft clay and silt per hour and pump this quantity on shore through a pipe line 5,000 feet in length and there seems to be no reason for assuming that this work cannot be performed. All her tests on the Clyde were carried out to the complete satisfaction of the Consulting Naval Architects, Messrs. Sir John H. Biles & Co., and from the time that the vessel was taken over by the Government of Bombay, the builders' responsibility ceased.

(2) The builders are naturally for their own sakes anxious that the plant should prove a success, but they are not specialists in the handling and working of dredging plant and in the absence of any specific complaint about the machinery or any portion of same, it is not clear what good interest could be served by their

representative going to Bombay. Nevertheless if it can be shown that a visit would be advantageous they are only too anxious to do what is possible in the matter.

(3) The lowness of the output of the " Sir George Lloyd " is in our considered opinion due to one of two causes, or probably a combination of the two :—

(*a*) Unsuitable material, and

(*b*) Inefficient handling of the plant.

It is obvious that if the dredger is put to work in such hard material that the cutter blades are damaged, as we understand was the case last season, or if the dredger with booster is asked to deliver continuously through a length of pipe line largely in excess of 10,000 feet, the output must be greatly reduced. We are therefore of opinion (and so informed Mr. Brims when he was here) that when the dredger is found to be working in this hard material, the suction pipe should be lifted and operations continued in the softer clay overlying the rock.

Regarding the handling of the plant, we suggested in our letter dated 25th May 1925, that on work of this description it is of vital importance to give an incentive to the men employed; we can only repeat and emphasize this statement and would observe that no contractor would for one moment have handled the job in the way in which it is being carried out in Bombay. In this connection we would invite a reference to paragraph 29 of Sir George Buchanan's report dated 11th February 1922, which reads as follows :—

" In carrying out a large public work departmentally success both economic and technical depends to a large extent upon the adequacy, efficiency, and loyalty of the engineering staff, technically because apart from actual design much depends upon workmanship, and economic because the spending of money and the employment of the best advantage of workmen is entirely in their hands.

" Government is in regard to its staff at a disadvantage compared with a contractor or a private firm. The loyalty and enthusiasm of a staff is often taken for granted but it is rarely spontaneous and in the case of a contractor or private firm bonuses are given for particularly good work and in other ways officers are encouraged to do a great deal more than is strictly required of them, also on the converse side if an engineer is inefficient a contractor will cut his losses and get rid of a man by paying whatever is legally due in lieu of notice. Government rules precludes either bonuses or pay in lieu of notice and I merely mention this matter because it is one of the chief advantages gained in employing a contractor for the execution of public works."

(4) If the difficulties in connection with (*a*) and (*b*) *supra* can be overcome we are absolutely confident that there will be an enormous increase in the output this season and in that case a final judgment on the ultimate cost of the reclamation by dredging might we suggest be deferred.

3. According to the figures given in your letter under reply, 1,261,986 cubic yards of material was dredged from the harbour during the last season, but only 680,438 cubic yards was deposited in Back Bay. The smallness of this latter figure obviously points to a great leakage from the area under reclamation and the advisability is indicated of tipping a water-tight moorum bank along the inside face of the sea wall and otherwise arranging for the detention within the area under reclamation, of as much as possible of the silt-laden water discharged through the pipe-line until the silt has precipitated. Under these circumstances, we disagree with the view taken that the quantity of filling as measured in the area to be reclaimed should be taken as the basis of calculating the output of the dredger. In all normal cases the quantity of filling is slightly greater than the quantity of material dredged as measured by sounding and, assuming that the Chief Engineer's figures given in your letter are correct, we consider that the loss of material in the reclaimed area is quite as serious a matter as the low rate of output of the dredger.

4. Respecting the quality of the material being dredged in the harbour, this is a question which, as you are aware, has been the subject of investigation, discussion, and report by Sir George Buchanan ever since the inception of the work because, as he has repeatedly stated in his reports, the crux of the whole undertaking is the successful reclamation of the area enclosed by the wall by pumping through pipe-lines the materials dredged from the sea bed and in his last annual report, dated 15th December, 1924, he reviewed exhaustively the position in respect to dredging plant and dredging operations It follows, therefore, that if as a result of this season's work it is found beyond doubt that there is not sufficient suitable material in the harbour for the economic reclamation of Back Bay by dredging it will be necessary to reconsider and modify the programme of operations, although we sincerely hope that such will not be necessary.

5. In your letter you observe that Government undertook the reclamation on the recommendation of Sir George Buchanan, contained in his report of September, 1919,

the essential feature of the proposals being the capacity of the dredger to reclaim the area at the rate of 2,000 cubic yards per hour. In this connection we beg to repeat that we have no doubt at all as to the capacity of the dredger to perform the work given suitable material, and we would point out that in recommending the work Sir George Buchanan relied entirely on the detailed survey and report of Mr. Kidd, who said it had been completely established that there was available more than three times the quantity required of suitable material. On this data Sir George Buchanan remarked, vide paragraph 34 of his report " on the assumption that Mr. Kidd's surveys and borings are correct, and I see no reason to doubt their accuracy, as a great many borings were taken, I accept his conclusion both in respect to quality and quantity of material." Sir George Buchanan did not himself take any borings nor in view of the urgency with which his report was required would there have been time to do so. We understand from Sir George Buchanan that Mr. Kidd's borings and estimate of quantities were also accepted as sufficiently accurate by the officials in the Public Works Department of the Government of India, when Sir George, at the request of His Excellency the Governor of Bombay, went to Delhi especially to discuss the project with the Government of India and obtain their sanction and approval to the technical details of the scheme.

6. With reference to the various letters and cables which have been exchanged between us with regard to the date of Sir George Buchanan's next visit to Bombay we very much regret to inform you that he is at present in such a bad state of health that his doctor has stated emphatically that in his opinion it is extremely unlikely he will be able to travel to India without the most serious prejudice to his health before the autumn of 1926. We need hardly say that this is a matter of very serious concern to Sir George who was relying on being able to fulfil his engagement, but ill-health is a matter which unfortunately cannot be guaranteed against.

7. In order to assist as much as possible your construction staff in solving the problems before them we are sending the senior member of our staff, Mr. J. Risely Settle, M.Inst.C.E., to Bombay to inquire into matters and advise on the spot; he leaves London this week. We also hope to be able to arrange that Mr. Halcrow pays a short visit to Bombay early in January and we shall be glad to hear from you if the Government will accept these arrangements which are the best we can make, in lieu of the visit of Sir George Buchanan required by our agreement. Should Sir George's recovery be more rapid than expected he will, of course, go to Bombay instead of Mr. Halcrow.

Yours faithfully,
C. S. MEIK AND BUCHANAN.

(II.)

Supplementary Statement by Sir Lawless Hepper, Director of Development.

In the course of the evidence before the Back Bay Inquiry Committee on the 19th August, 1926, it is recorded that Mr. H. P. Mody, on behalf of the Bombay Municipality, stated, in reply to a question by Sir M. Visvesvaraya, that no estimates were placed before the Advisory Committee. This is incorrect.

2. To begin with, a copy of the Press Note No. S.A. 3709, dated 20th September, 1921, containing the correspondence with the Indian Merchants' Chamber, giving the probable cost, as at that time ascertained, was furnished to all members of the Advisory Committee.

3. The detailed project estimate prepared by Mr. Lewis, then Chief Engineer, was submitted to Government in May, 1922, and was forwarded to the Audit and Accounts Officer, Bombay Development Scheme, for scrutiny by the Finance Department. This estimate, which amounted to Rs. 697,79,350, become the estimate of Rs. 702,43,321 after examination by audit, owing to the necessity for the inclusion of certain additional adjustments, notified by the High Commissioner, on account of the purchase of plant, of which Mr. Lewis had not been aware.

4. This estimate was placed before the Advisory Committee at a meeting held on 27th June, 1922, when the Committee, after considerable discussion, unanimously recorded the following resolution :—

> " The Committee approve the detailed project estimate for the Back Bay Reclamation amounting to Rs. 697,79,350. It should be forwarded to Government with the recommendation that it should be sanctioned."

A copy of the minutes of the meeting in question is attached.

5. As explained above, this estimate was subsequently increased by Rs. 4,63,971 (equivalent to an increase of 0·66 per cent.) and was sanctioned by Government in

October, 1922 for Rs. 792,43,321. A copy was furnished to members of the Advisory Committee, and also, on 7th November, 1922, to all members of the Legislative Council.

6. On the 19th September, 1923, a printed note (copy attached), dated 20th August, 1923; was circulated to members of the Advisory Committee, which contained, *inter alia*, as Appendix II, a financial forecast of the Back Bay Reclamation Scheme based on the sanctioned project estimate of Rs. 702,43,321, combined with the East Colaba Reclamation Scheme. This forecast was discussed by the Advisory Committee at a meeting held on 26th September, 1923, when it was resolved that the same should be recorded.

7. Up to 25th August, 1924, the Committee's functions had been of an advisory character, but on that date the Government of Bombay in their letter No. S.D. 1313 (see copy printed as Appendix A to the first *ad interim* report of the Committee dated 17th February, 1925, asked the Committee :—

> " To enquire into the activities of the Development Department and to report as to how far, and in what directions, such activities should be continued or eliminated."

The personnel of the Committee was increased for the purpose of this special enquiry, and the first and second *ad interim* reports of the Committee are the result of this reference.

8. It does not, therefore, appear to be correct to say that no estimates of the Back Bay Reclamation Scheme were placed before the Advisory Committee. The records show that all information that was available in regard to the estimates was communicated to them.

(III.)

Supplementary note by the Director of Development dated 10th October, 1926, regarding the ascertainment of dredging results.

From the transcript of the evidence of Sir Henry Lawrence it would appear that considerable emphasis was laid by the Back Bay Inquiry Committee on the fact that Government waited until July, each year, for the dredging results of the previous season, the suggestion being that some action might have been taken on the weekly figures showing the material dredged as ascertained by soundings.

2. I have always regarded these measurements with suspicion. If the material were stiff clay throughout, there would, perhaps, be little ground for doubt. But there is a thick layer of fine silt which overlies the clay, and this material would hardly stand at a steep angle at the sides of the excavation. It seems reasonable to suppose that it may flow into the excavation, from an area much greater than the excavation itself, as the dredger moves forward; in which case the subsequent measurements may give a quantity dredged substantially less than the amount actually removed.

3. It was impossible, during the first two seasons, to form any conclusions on this point; because, the sea wall being unsealed, a large amount of the material dredged was lost. The only definite fact that *was* known was the quantity which remained in block 8 after dredging ceased at the end of May. A large number of sections had then to be surveyed and plotted in June, and the computation of the quantity was completed by about the middle of July. Under the conditions which obtained during the first two seasons, it is difficult to see what other figure would have been a reasonably safe guide as to the progress of the work. The weekly figures were, of course, sufficient to throw grave doubts on the performance of the plant per pumping hour, and Messrs. Meik & Buchanan's attention was drawn to this. But the figures could hardly have been used to enable Government to form any reliable estimate as to progress of the scheme in terms of consolidated filling, which, after all, was the essential thing to know.

4. The figures of the season 1925-26, when the wall was sealed, rather confirm the suspicion that the measurements, taken in the harbour, underestimate the output. The quantity dredged, as taken from soundings, amounted to 1,828,000 cubic yards. The measurements taken in situ in June, 1926, on the other hand, gave 2,266,645 cubic yards, in spite of the fact that in April and May, 1926, when the weir could be raised no higher, a considerable quantity of silt passed, with the overflow, into block 7. Some of this was lost through the unsealed wall of block 7, and some remains in the area. It was proposed to seal the sea wall in block 7 in April, 1926; but in view of the uncertainty as to the future programme of work, Government did not consider it desirable to sanction this being done. We still do not know, therefore, with certainty, what the actual output of the plant is. To arrive at this it would be necessary to have an adjoining block B ready sealed to hold the silt as soon as the level of the mud in block A reached a height at which losses of silt become inevitable. Such conditions are not possible if expenditure is rigidly restricted to the block actually being filled.

(IV.)

Note by the Acting Chief Engineer, Reclamation Branch, regarding Mr. Nariman's supplementary statement of 23rd August, 1926 (page 394 of Evidence).

The amount paid to Balakrishendas Seth in the season 1925-26 for cleaning and painting the floating pipe-line was Rs. 1,00,51/-.

This year tenders were invited, and were received, as follows :—

		Rs.
1.	Narayanrao G. Todankar	73,550
2.	Madhoram Ragoomal	53,610
3.	D. H. Dhunjibhoy	97,751
4.	Fakhruddin & Co.	50,574
5.	Hatimbhoy Gulamhusein & Bros.	79,944
6.	Shamji Gokal & Sons	58,854
7.	Venkoo Baloo & Sons	55,694
8.	British Continental Trading Co.	1,53,130
9.	F. C. Framji	67,134
10.	The Indian Engineering Co.	1,33,351

The average amount of the tenders received is Rs. 82,359, whilst the amount of the accepted tender is Rs. 53,610/-, and was the lowest tender of those submitted by firms having previous experience of this class of work.

The present contractor has not proved satisfactory. His work has to be closely supervised as he is apt to scamp the work both in cleaning and painting. He has, on one occasion, been ordered to stop work on the contract on account of his bad work, but was subsequently allowed to continue on his promising to carry on the work in strict accordance with the instructions given to him and because considerable delay would have been incurred in getting another contractor to carry on the work. He has informed the Deputy Dredging Master that he is losing money on this contract, which probably accounts for his trying to scamp the work.

The present contractor has the advantage of the coolie lines at Shewa which he was able to purchase at scrap rates from the previous contractor, Balakrishendas Seth, who was not allowed to tender for the work.

The D. E. C. Dredging Section states that much more scraping and cleaning was required last year as the pipes were in a much worse condition than they were at the close of the season just past.

In previous years the contractor had to make his own arrangements for purchasing paint, which was specified by us, at his own cost. This entails a capital outlay on his part of Rs. 12,742/-.

The price paid by Balakrishendas Seth for anti-corrosive paint last year was Rs. 49/- per cwt., and in 1924 from Rs. 50/- to Rs. 55/- per cwt..

For the present contract the paint has been purchased by Government at Rs. 46/- per cwt., the price having fallen, and is supplied to the contractor at this price, the cost of such paint being deducted from the contractor's bills.

The prices for other materials were the same in both cases.

In addition to all the above, it must be pointed out that Balakrishendas Seth had to paint a total area of 13,17,467 Sft. as against 10,06,300 Sft. for this year's contract, as shown at the head of the accompanying statement. If the costs of two contracts are worked out on last year's areas the difference is Rs. 1,00,000/- – 61,930/- = Rs. 38,070/-. If the difference in the cost of paint, i.e., Rs. 774/-, is allowed for, and a profit of, say, 10 per cent. is allowed Balakrishendas Seth on the money he had to spend on the purchase of paint, i.e., Rs. 1,264/-, this difference is reduced to Rs. 36,032/-.

As regards the quarrying of stone, tenders were called for in September, 1922. Twenty-three tenders were received, that of contractor Ramachandra Patkar for Rs. 0-13-0 per ton being accepted. There were five tenders lower than this, the lowest being for Rs. 0-10-0 per ton. This was received from a contractor who was at the time working on the construction of the Marine Lines Colaba Railway. His work on this was extremely bad, and the delay in getting this job completed was largely due to this He was subsequently taken off this job on account of his bad work. The other four tenders were not accepted for reasons of non-experience. For example, one of the persons tendering was from a man working as a foreman under the contractor referred to above, and who had no previous individual experience of contract wok. These tenders were opened in the presence of the contractors and reasons for accepting Ramchandra Patkar's tender and for not accepting the lowest tender were explained at the time to the contractors present.

The total payment made to the firm under this contract to June, 1925, when stone quarrying ceased, was Rs. 5,67,939/-.

The contractor was given free use of cranes and crew under this contract.

There was no tender of under nine annas per ton. The lowest tender, as stated above, was for annas ten per ton.

In March, 1924, as it was foreseen, the requirements of stone for the works in Bombay would fall off shortly for the monsoon period, orders were given that wagons not required for stone should be loaded with earth at Kandivli, and the two full rakes of 50 wagons each maintained. At that time it was anticipated that this earth work would be for a short period only, and as R. K. Patkar, being the Quarry Contractor, and having the labour on the spot which would again be required for the quarry when the two rakes of stone would again be needed, the contract for excavating and loading was naturally given to him. Moreover, the quantity of stone required for Bombay varied largely, and frequently, according to the exigencies of the work there, and as the balance of the wagons not required for stone was loaded with earth the quantity of earth varied also, and the labour necessary for these two works varied. The only way to meet such variation was to have one contractor for both works so that he could move his labour as required. Besides this, R. K. Patkar's labour was by that time well trained to quarry work, and as it was anticipated that two rakes of stone would be required in the next season, it was considered desirable to keep them on the work. It was anticipated that, owing to the cutting out of the cross walls from the Bombay works, the quarries would be producing a larger quantity of rubble than could be used immediately in the works in Bombay, as the quantity of large blocks required in Bombay for the sea wall was in a higher ratio to the rubble used than the quarry produced. This surplus rubble would have to be stored at the quarry, and it was desirable to have a place where it could be stacked without double handling into wagons, shunting and unloading again. Accordingly the contractor was directed to excavate from a bank of moorum opposite the quarry. This bank of moorum was hard and full of rotten rock, much of which required drilling and blasting, hence the rate of annas ten.

This piece of levelled ground has, in fact, been used as was intended, and the surplus rubble is stacked there to-day. The rate of annas ten was reduced to annas eight a year later when this bank was finished and the contractor was put on to load earth from the hill side at the back of the power house. This work was known to be for a short period only, through the rains, the most difficult part of the year, as it was then (in June, 1925), anticipated that the quarry would be opened next season. As soon as it was definitely decided that the quarry would not open again tenders were called for and the present contractor employed, his rate being Rs. 0-5-1 per ton for excavation and loading. The total amount paid to contractor Ramchandra Patkar under these two contracts is Rs. 1,89,282/-.

Regarding Mr. Patkar's profits, I may state that during the period he was working here he also carried out other contracts, one for building of a Hospital at Parel, amounting to, I believe, over ten lakhs, or 30 per cent. more than his total receipts from the quarry contract.

Comparison of Costs of Scraping and Painting Pontoons on 1925–26 *and* 1926–27 *rates.*

Year.	1st Coat : Chipping, Scraping and Priming.	2nd Coat : Anti-corrosive.	2nd Coat : Hard-protective.	3rd Coat : Anti-corrosive.	3rd Coat : Hard-protective.	4th Coat : Anti-corrosive.	Total.
	Sq. ft	Sq. ft.	Sq. ft.	Sq. ft.	Sq. ft.	Sq. ft.	Sq. ft.
1925–26	4,14,918	4,14,918	—	4,14,918	—	72,713	13,17,467
1926–27	4,14,700	1,04,000	3,10,700	1,04,000	72,900	—	10,06,300

		1925–26.			1926–27.		
1st Coat : Chipping, Scraping and Priming	4,14,918 sq. ft. at	Rs. 12/8/0	100 sq. ft.=	Rs. 51,814/12/0	At Rs. 6/11/0	100 sq. ft.=	Rs. 27,747/10/3
2nd Coat : Anti-corrosive ...	4,14,918 „	„ 6/0/0	„ =	24,895/1/3	„ 3/13/0	„ =	15,818/12/0
3rd Coat : Anti-corrosive ...	4,14,918 „	„ 5/0/0	„ =	20,745/14/5	„ 3/13/0	„ =	15,818/12/0
4th Coat : Anti-corrosive ...	72,713 „	„ 3/8/0	„ =	2,544/15/3	„ 3/8/0	„ =	2,544/15/3
							Rs. 61,930/1/6
Excess payment of Balkishendas Seth, Rs. 3/- per cwt., for 258 cwts. of paint				—			774/0/0
Add 10% for Contractor's profit over cost of 258 cwts. of paint at Rs. 49/- per cwt.				—			1,264/0/0
				Rs. 1,00,000/10/11			Rs. 63,968/1/6
				63,968/1/6			
Excess over 1926–27				Rs. 36,032/9/5			

EVIDENCE

Oral and Documentary

RECORDED BY THE

BACK BAY ENQUIRY COMMITTEE.

1926.

PART II.

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The Committee Assembled at 11 a.m. on Friday, 17th September, 1926, at 6, Richmond Terrace, Whitehall, S.W.1., all the Members being present, except the Chairman.

Sir M. Visvesvaraya: The Bombay Back Bay Enquiry Committee appointed by the Government of India commenced its work on the 2nd August in Bombay. The examination of the Bombay witnesses occupied the Committee till the 24th August. The Chairman of this Committee, Sir Grimwood Mears, is expected to arrive here and join the Committee on September 26th. The regular public sessions for taking evidence will begin on or about September 29th, but for one special reason or another we have to examine a few witnesses before that date. Sir Henry Lawrence will assist the Committee by giving evidence to-day, as it is understood he will be leaving for India very shortly.

39th Witness, Sir Henry Staveley Lawrence, K.C.S.I.

Sir M. Visvesvaraya: In what year did you become a member of the Executive Council of Bombay?

A.—In April, 1921

Q.—On what date did you retire from that office?

A.—In March, 1926.

Q.—You also officiated as Governor of Bombay?

A.—Yes, the last three months after March, 1926.

Q.—You have retired very recently and you are doubtless familiar with the principal facts connected with the control or administration of the Back Bay Scheme?

A.—Yes.

Q.—Can you tell us generally what was the object of commencing this reclamation scheme? Was it to extend the area of the city or was it to have a productive public scheme, or was there any other reason?

A.—The scheme was commenced and sanctioned two years before I joined the Government.

Q.—You joined when?

A.—In 1921.

Q.—When was the scheme sanctioned?

A.—In 1919.

Sir M. Visvesvaraya: I think in 1920.

Mr. Billimoria: The official sanction was in 1920.

Sir M. Visvesvaraya: The sanction by the Government was in October or November, 1920.

A.—But work had been begun before then.

Q.—That is true.

A.—Discussions between the Government of Bombay and the Government of India and the Secretary of State went on from April, 1919, but Sir George Buchanan's report was received in October, 1919, I think. The Secretary of State's approval for raising the loan and of the other financial arrangements was given early in 1920, and the Directorate of Development was actually established from November, 1920. I think that is as near as possible the course of the dates.

Q.—The scheme was evidently sanctioned about the middle of 1920.

A.—What date the sanction of the Secretary of State was given formally I do not know, but it received his approval and was carried on with his approval from some date—about the middle of 1919. Then you said you wanted to know the purpose of it.

Q.—Yes. What was the object of the reclamation scheme?

A.—I was not acquainted with the discussion which went on at that time because I was not in India, but from my subsequent reading of the papers I gathered that there were two primary objects. The first was to improve the conditions of life for the poorer classes in the congested areas of Bombay, and the second was to reduce the heavy cost of all commercial transactions and make Bombay a more efficient and workable port by reducing the cost of land. The enormous height to which the cost of land has risen, owing to the war, and owing to the profits which poured into Bombay during the war became a very heavy burden on all the trade of Bombay, and it was to assist the future prosperity of Bombay that it was considered necessary to reclaim from the sea a large area of land in the immediate vicinity of the business quarter of Bombay.

Q.—You are aware that when the project was first sanctioned the cost was to be 367 lakhs?

A.—Yes.

Q.—That was sanctioned in 1920. The revised project was sanctioned increasing the estimates to 702 lakhs in October, 1922?

A.—Yes.

Q.—That is roughly two years after the first project was sanctioned?

A.—Yes.

Q.—Since that date the necessity for further expenditure has become evident, and according to the engineers the cost of completing the work is now likely to amount to 10 crores or a thousand lakhs.

A.—Is that so?

Sir Frederick Hopkinson: 1,100 lakhs.

Sir M. Visvesvaraya: I think it is a thousand lakhs. While the estimates of cost have doubled or trebled you are aware that the value of land in Bombay has gone down?—Yes.

Q.—You expected large profits on account of the high prices which ruled in 1920 and 1921?

A.—Some profits, yes—whether you take the figure as high is a matter of opinion.

Q.—For these and for other reasons the scheme is now expected to result in a loss to the Government?

A.—That depends on the latest estimates, which I have not seen. I do not know on what figures you say that the engineers now estimate the cost at 1,000 lakhs.

Q.—Sir Frederick Hopkinson says it will be 1,100 lakhs.

A.—I do not know on what basis that calculation has been made.

Sir Frederick Hopkinson.—On the basis of cost?

A.—I do not know who prepared it.

Q.—The Government engineers.

A.—Quite so. You do not ask my opinion on it?

Sir M. Visvesvaraya.—I only want to remind you of those figures and the present position of the works.

A.—Yes.

Q.—If Block 8 is completed and the work stopped it is expected that the net loss will be roughly four crores.

A.—If the work stops at Block 8?

Q.—After completing and selling Block 8 the loss will be Rs. 4 crores. That is the latest figure we have got from the engineers and the financial officers concerned.

A.—Yes.

Sir Frederick Hopkinson.—You might tell the gentlemen of the Press, who are not perhaps familiar with these figures, that when you speak of a crore the amount meant is £750,000, and a lakh is 100,000 rupees, which at the present exchange is about £7,500.

Sir M. Visvesvaraya.—Was the 367 lakhs estimate, submitted in 1919 or 1920, regarded as an approximate estimate at the time it was submitted, or was it treated as a regular official estimate?

A.—It was a figure put forward by Sir George Buchanan in his first report. I have no opinion as to how he arrived at that figure.

Q.—But how did the Government regard the estimate? Did they regard it as a provisional one or as a final estimate?

A.—I was not at headquarters, nor was I in India at the time. I am afraid I cannot answer that question.

Q.—But you have dealt with the later estimates—the 702 lakhs estimate?

A.—Yes.

Q.—You have heard of that, and I thought perhaps you might have gone into that question?

A.—Yes, but I cannot tell you what was in the mind of the members of the Government at the time when they saw these figures.

Q.—It is stated that the 702 lakh scheme was a final one, and that the 367 lakh scheme was only an approximate figure, the details of which had to be worked out after the preliminary sanction was given. Is that so or not in your opinion?

A.—I should think that is correct.

In one of the statements of the Government the estimate was put at 400 lakhs. It gave the impression that that was the correct amount of the estimate. There was no mention of any approximate figure on that occasion.

Sir Frederick Hopkinson.—A margin of 10 per cent. was allowed.

Sir M. Visvesvaraya.—That meant 367 lakhs plus 10 per cent. would make roughly four crores, but no mention was made that the estimate would be more than four crores?

A.—Quite so.

Q.—The 702 lakhs estimate was sanctioned in your time in October, 1922, I think?

A.—Yes.

Q.—But there has been no sanction accorded to the excess expenditure incurred since then. The estimate was sanctioned in October or November, 1920, and it was revised in October, 1922, but there has been no revision since, although there have been excesses of expenditure. Can you explain the reason why?

A.—Since 1922 or for some time, I think, we were waiting for the work of the dredger, and these estimates depend for their accuracy almost entirely on the output of the dredger. That dredger did not begin work until December, 1923. The first year's results were known in the autumn of 1924.

Sir Frederick Hopkinson.—Not till the autumn? The directorate's report of 31st March, 1924, gave them, did not they? Did not the Development Directorate's report of 31st March, 1924, give those results?

A.—No, it could not possibly do so. The work was going on until the middle of May, 1924, and the figuring out of the results was only done after May, 1924, and the reports would reach Government some time about August, 1924. When those figures proved to be unsatisfactory they were referred to Sir George Buchanan, who, I think, was in London at the time. His point of view was that the first year's working of a new machine of this rather novel type—novel size at any rate, if not type—could not be taken as a guide to its working in subsequent years, and he asked that the matter should be held up for decision for another year. The results of that second year only became known in August, 1925. Then those results have been the subject of discussion and inquiry by many engineers, and I had left India before the final figures at the last Committee of Engineers were reported to the Committee, and I do not know what those figures may be.

Sir M. Visvesvaraya.—Why was not a public statement made to that effect instead of keeping this question open for three years. I hope you do not mind my putting it to you in that way?

A.—At what stage do you suggest that a public statement should have been made?

Q.—After a couple of years or so, when you formed the view that things were unsettled and unsatisfactory, and that the project was not going to make good.

A.—That is to say after the second year's working?

Q.—Yes—not only the point about the dredger, but the exact position of the schemes might have been explained to the public—it is so stated by many critics.

A.—Quite so, it is so stated, but when was the first Advisory Committee appointed? I have forgotten the dates. It was at the end of 1924, was not it?

Mr. Billimoria: The second interim report was published on the 25th August, 1924.

Sir M. Visvesvaraya.—The witness is referring to the appointment of the first Advisory Committee.

A.—I do not quite follow the date Mr. Billimoria has given.

Mr. Billimoria: It is the 25th August, 1924, which was the second interim report on which the Government then decided.

A.—Report by whom?

Q.—By the Advisory Committee.

A.—That Advisory Committee contained members of the Legislative Council, did not it?

Sir M. Visvesvaraya: Some of them.

A.—Is not that a publication? If the Legislative Council select their members and they are put on a Committee to which all the papers are referred, is not that a publication? Nothing was kept secret by these members of the Legislative Council. There is no reason why it should have been.

Q.—It is stated that full information was not given to that Advisory Committee, and we want to know what the truth is from your point of view. It is stated that full information was not laid before that Committee. Several witnesses have deposed to us that full information was not laid before the Advisory Committee and the information asked for was not furnished on the ground they were not concerned.

A.—I should hesitate to accept those statements. I was not at the Advisory Committee, and I do not know anything of what went on there.

Q.—We only want to know why no steps were taken to take the public into the Government's confidence in this matter and keep the public informed of the progress of the work and its financial results.

A.—Well, so far as the Government are concerned, I think the answer is that when this Committee was appointed and the Government understood that the Committee had access to all information, they thought that full publicity had been achieved. No complaint ever reached the Government from this Committee to say that any information had been withheld. I never heard of any complaints at that time.

Q.—There are complaints.

A.—Now?

Q.—In the evidence given before us reference has been made to complaints made then.

A.—But not to the Government?

Q.—Yes, to the Government and in the Legislative Council.

A.—I cannot remember any such complaint ever coming to my attention.

Q.—Anyhow the excess expenditure was evidently incurred without regular sanction for two or three years?

A.—No. When expenditure has been undertaken it has received regular sanction. The estimate is that after so many years the work may cost so much.

Q.—For so much quantity of work the cost will be so much—that is the idea of the estimate. If an excess is apprehended the estimate should be revised.

A.—Yes, but no expenditure has been undertaken to my knowledge for which sanction has not been duly received from the Government with the approval of the Legislative Council.

Q.—It was stated that expenditure to the extent of over Rs. 190 lakhs was incurred without regular sanction as required by the Public Works Department Code. Can you state why this was so?

A.—That is a statement, I know. I have heard that, but that refers, I think, to the expenditure which started from 1919 on the construction of the dredger, does it not?

Q.—No, the total expenditure.

A.—But it includes that.

Q.—It must be included in that.

A.—Is the suggestion that that expenditure was unauthorised and incorrect? Is that the suggestion?

Q.—Whatever expenditure was incurred should have been publicly recorded in a Government resolution. I believe that was what the critics meant with regard to this point.

A.—It is a very technical point, is it not?

Q.—Well, it is said that expenditure on several works has been passed by Government without waiting for sanction to estimates according to the requirements of the Public Works Department Code, and the aggregate of these items amounted to over 1,90,00,000 of rupees. The accuracy of that statement was questioned, but a witness insisted that it was true.

A.—You are quoting from the auditor's report.

Q.—The witness was quoting from the auditor's report.

A.—What year?

Q.—1921-22.

A.—But the expenditure was in 1919 and 1920.

Q.—You are not concerned with it?

A.—It is a minor point that I am not concerned with it, but the Legislative Council was not in existence then. The Reformed Legislative Council was not in existence then. The Regulations under which that report was written were not drawn up and were not in existence.

Q.—Was that pointed out to the people who objected to the expenditure at the time?

A.—Yes, it was. It was discussed in the debates of the Public Accounts Committee, and it was pointed out that the auditor in question had made a slight error, because he was applying rules which were subsequently framed to expenditure which had been undertaken before these rules came into existence.

Q.—Were there any rules which prevented the recognition of the excess expenditure until the issue of a regular Government order in the form of a Resolution?

A.—My belief is that that expenditure was regularised in accordance with the rules that existed at the time.

Q.—At a later stage?

A.—At a later stage. I was not with the Government at the time, but my impression is that the procedure was quite regular in so far as the Governor and the Government of that day had power to give these sanctions without reference to the Legislative

Council, a power which was subsequently taken away under the new system. Is that quite clear now?

Q.—From your point of view, I think it is. It is stated that before sanctioning it in October, 1922, the project was not submitted to the Government of India—this 702 lakhs project was not submitted to the Government of India; neither was it brought to the notice of the Reformed Legislative Council. Can you explain what truth there is in this suggestion, or what your own view is about it?

A.—Perhaps I had better go into the machinery that was established. The Government of India had their own officer in Bombay who was working for the Government of India as Deputy Comptroller, and was also Financial Adviser to the Development Department. Therefore, any item of this kind would be reported direct by that Financial Adviser to the Government of India.

Q.—The project of 702 lakhs was sanctioned by the Local Government?

A.—Yes.

Q.—The original project of 400 lakhs was sanctioned by the Government of India and the Secretary of State?

A.—Yes.

Q.—Should not the same authority which sanctioned the original scheme have accorded its sanction to the revised estimate which was so much larger?

A.—No.

Q.—Why not?

A.—For this reason, that in the interval the whole system of Government had been changed. The Reformed Government had come into existence from the 1st April, 1921. The detailed powers of control previously exercised by the Secretary of State and the Government of India had been delegated to the Local Government, and therefore it was not within their power to interfere in this matter.

Q.—Was the Local Legislative Council consulted? The powers of the Secretary of State were withdrawn in favour of the Legislative Council to some extent?

A.—Yes.

Q.—Did you consult the Local Legislative Council in according sanction to the 702 lakhs scheme?

A.—The sanction to the estimates was, as I take it from you, given in October, 1922. That could have no effect unless and until the Legislative Council gave their sanction to the Budget. That 702 lakhs figure was put into the next Budget. The Budget was being prepared through October, 1922. That figure was printed and published immediately afterwards and was sanctioned by the Legislative Council in February, 1923.

Sir Frederick Hopkinson.—You said just now that the Government of India had no control over these estimates, or the provision of the money, but actually they found the money, did not they?

A.—I am afraid I expressed myself badly if I said that. I did not say they had no control over it. I said the same detailed control that was previously required under the old Government system, by which the Government of India had to sanction these estimates, was withdrawn.

Q.—Surely, if an estimate is doubled, it would be sanctioned by the Government of India which found the money?

A.—No. The Government of India only found the money at our expense and at our cost.

Q.—I know that.

A.—It was merely by private arrangement between the Governments.

Q.—But the Government of India had to give sanction to the scheme originally? Therefore, they would surely keep control if the scheme were to be multiplied by 10?

A.—They could interfere, and they were given an opportunity of interfering, because all these facts are published and were within their knowledge.

Q.—I have had a long discussion with Mr. Cowasjee about this subject, and, in the end, he came to the conclusion that you have come to, that the Government of India could interfere.

A.—Certainly they can interfere. They have final authority under the Act.

Q.—Naturally.

A.—It is a matter for their discretion when to interfere.

Sir M. Visvesvaraya.—When you had obtained sanction for a 702 lakhs project you had to go to the Legislative Council to get the Bill passed for the funds?

A.—For the raising of the loan, yes.

Q.—Did the same sanction hold good when your estimate was doubled in 1922? When your estimate was doubled in 1922, could you assume the old sanction as holding good in that instance also?

A.—No, we made no such assumption. We placed the new figures before the Legislative Council in the Budget of 1923.

Q.—Is the ordinary Budget statement quite sufficient for the purpose? Was not it necessary to carry it in another Bill?

A.—No. No further Bill was required. The money had to be provided by vote of the Council in the Budget debate.

Q.—That was enough, was it?

A.—That was enough.

Q.—Was not a full debate necessary on the whole question when the project was practically doubled?

A.—It could be raised at any moment by any member of the Legislative Council. He had a right, and some of them exercised the right of objecting to any particular portion, or to any item entered in the Budget. I think if you refer to the Budget debate in 1923 you will probably find that there were votes taken as to whether such and such an item in this figure of 702 lakhs should be sanctioned or should not be sanctioned.

Q.—Is that the right and correct procedure? The whole subject has to be reviewed, has not it, when the estimate is exceeded to a figure of that magnitude?

A.—It is open to review. Any member can object to the whole figure of 702 lakhs, or he could object to any item in it.

Q.—And, as you said, the Government of India could interfere?

A.—Yes.

Q.—What steps were taken by the Government of India to keep themselves informed of the progress of the work under the changed conditions and circumstances of the work?

A.—That, I am afraid, I cannot remember at this lapse of time, but they had frequent reports from the financial adviser who, as I say, was their own officer.

Q.—He confined his attention to the financial aspect of the scheme and not to the technical details or engineering aspects?

A.—I thought you were questioning me about finance.

Q.—When the Government of India sanctioned it, they also looked into the general engineering aspects of the scheme?

A.—Into the engineering part.

Q.—And also the general aspects of the scheme when they gave their sanction—I mean, they did not only confine their attention to the financial aspects?

A.—When they gave their sanction, I fancy they must have had some advice from someone—some engineering adviser, I think, they must have had, but I do not know.

Q.—I want to know what steps were taken by the Local Government to keep the Government of India informed? You first asked them to give their sanction to an expenditure of 367 lakhs, and you got that sanction. Then when the estimate was increased you should have informed them that the estimate had been doubled and that further sanction was necessary. Did you do this? Did you inform them of the change in the circumstances?

A.—I cannot remember any definite report.

Sir Frederick Hopkinson.—I presume you would send them a copy of the Development Directorate's Report?

A.—Certainly, they would get all that.

Q.—Is that the only means of communication?

A.—And the Budget debates.

Q.—Which would be at a later date?

A.—As between October, 1922, and February and March, 1923.

Q.—Generally speaking, the only information which the Government of India had as to the progress of the works was in the Development Directorate's Report at the end of the working year?

A.—Yes.

Sir M. Visvesvaraya.—The Development Directorate were submitting their annual reports. There have been no other reports, save what was contained in the speeches by the members of the Executive Council?

A.—There has been a constant stream of reports.

Q.—Were they issued to the public? Was there any definite statement of the progress of the work issued on the authority of the Government to the public at any time in these three years?

A.—Between 1922 and 1925?

Q.—Yes.

A.—There are these reports of the Advisory Committees, but they are not on the authority of the Government, exactly.

Q.—They came afterwards. They came in 1925. Until the reports of the Advisory Committee were published, what steps did the Government adopt to take the public into their confidence? Considering that the circumstances had very greatly altered, was not it necessary to take the Government of India and also the public into your confidence in these matters, since things had not been developed on the lines that the Government of India and the public had expected? That is the point I want to know about from you.

A.—I would ask you to consider very carefully the progress of time, and to consider from time to time what reports it was possible to make. In October, 1922, this estimate was passed. You accept that. In 1923 the work was going on very favourably. You accept that. The dredger had not begun. The whole trouble arose from the working of the dredger. I wish to make that very clear and emphatic.

Q.—There are various reasons. One of the reasons, as you remarked at the beginning, was the fall in the value of land. That was a very material consideration.

A.—That has not begun to operate yet.

Q.—Has it not?

A.—We are not selling any land.

Q.—You are not selling any land it is true, but the fall in the value of the land has affected the outlook.

A.—Yes, the fall in the value of the land has changed the outlook.

Q.—And considerably, too.

A.—But we have not lost one penny through the fall in the value of the land in cash, so far.

Q.—It is a prospective loss?

A.—It is a prospective loss, yes, if the value of the land does not go up again. But I want to go back to the question of the time. During 1923 the work that was going on on the wall and the work in the quarries was all work being done very satisfactorily and efficiently—well below the estimates, according to my information.

Q.—A great deal of that information is true.

A.—Therefore, there is nothing to report to the public adverse to the scheme in 1923.

Q.—You must have read the Development Director's Report. That officer made a statement before us that he economised information in order to please the Government.

A.—My knowledge of what passed in your enquiries in Bombay is very scanty, but I was unable to ascertain to what point of time the Director was referring when he made that statement, and I think the point of time is the most vital point here.

Q.—There are many vital omissions in his reports, and when questioned about them he said he did not know what the policy of the Government was and so could not commit the Government.

A.—I am not concerned with what he did or wrote or subsequently said.

Q.—I want to know whether he represented the Government view or whether the Government took steps themselves to take the public into their confidence in this matter?

A.—I think on that point I had better explain the Budget debate because it is at the time of the Budget debate that the public had the most thorough means at their disposal of finding out what was going on. The Budget debate of 1923 gave an opportunity for any member to raise these questions.

Q.—But it is alleged that members of the Government also misled the public in regard to the prospects of the work. They gave optimistic figures about the productive character of the work and about its progress. What is your view about that?

A.—Could you tell me what figure you are referring to when you speak about optimism?

Sir Frederick Hopkinson.—One member of the Government hoped for a profit of 50 crores and another said 30 crores.

A.—You say they said so in the Legislative Council.

Sir Frederick Hopkinson.—Some member said 30 or 50 crores.

Mr. Billimoria.—The statement was put that at a very modest estimate there would be a profit of 30 to 50 crores. That is a very astounding statement in view of present circumstances.

A.—Was it accepted as a serious statement?

Mr. Billimoria.—I think the public believed it.

A.—Did they?

Q.—Yes, as coming from members of the Council.

A.—Yes, but would you give me the date and the name of the gentleman?

Mr. Billimoria.—Sir Chimanlal Setalvad made that statement in February, 1921.

Sir Frederick Hopkinson.—He had been financial representative of the Government.

Mr. Billimoria.—No, he was a general member of Council.

A.—I believe you are going to have Sir Chimanlal to answer for that particular point. My own impression is that most people who heard him thought that he was mixing up lakhs with crores.

Sir Frederick Hopkinson.—No, I do not think so.

Mr. Billimoria.—It could not be that, because further on he says he is positive about it—it is not a mistake of figures.

Sir Frederick Hopkinson.—It is a general statement on what was to produce the profit.

A.—That is quite true, but when you are going to write down a number of crores you do write a number of ciphers and you may go wrong.

Q.—But it is in words.

A.—It is not for me to go into it. He had three crores in front of him and he read it as 30 crores. I think he slipped up on a cipher.

Sir M. Visvesvaraya: This is the statement: "The land produced by the Back Bay Reclamation Scheme will certainly be for people who will pay for it. But Rao Bahadur Chitale will remember that 30 or 40 crores of rupees, the profit which will be realised out of the land that will be reclaimed, will be available for ameliorating the condition of the poorer classes." This was a statement made in February, 1921. Then in another place he says: "But even supposing we can get land for Rs. 20, making all liberal allowances for mistakes and miscalculations which we do not anticipate, still bearing in mind the present market value of the land, we would make a very, very big profit on that scheme." There are also other members who made similar statements. If you were not at Bombay you would not know about them.

A.—You must get it from Sir Chimanlal Setalvad. I heard him make that statement, and I got somebody to pull his coat-tails and say three crores and not 30, but he would not alter it—he was too engrossed in his speech.

Q.—It is said that the project was sanctioned under the Reformed powers by ignoring the Reformed Council.

A.—I do not know what that means.

Q.—It is said that the Reformed Legislative Council was ignored.

A.—At what stage?

Q.—In sanctioning the 702 lakhs project. You claim that because the Budget was passed the scheme was also authorised?

A.—Yes.

Q.—You did not require sanction to the fund separately for prosecuting a work of this magnitude?

A.—Separate sanction is taken in the Budget.

Q.—That is sufficient, you think?

A.—Yes.

Q.—So if an estimate is doubled or trebled you are not required to go to the Legislative Council for funds, except to the extent of asking for funds in the Annual Budget for the year's expenditure?

A.—That is the only way in which you can make the sanction effective. If you prepare an estimate, say, in September and October, at the time when the Budget for next year is being prepared, you put that estimate into your Budget and put it before the Council, and until you put it before the Council and obtain their sanction that estimate is merely a piece of paper; it cannot be effective.

Q.—That is the procedure adopted, as I understand, for ordinary departmental estimates, but for a big scheme of this magnitude is not a special procedure necessary? Could you tell us why the work was taken out of the Public Works Department? You are not responsible for that, I know, but we wish to know what the attitude of the

Government was in those days. The work was taken out of the Public Works Department and placed under a department specially created for the purpose. Was that necessary, in your opinion? You have considerable experience of the departments of the Government in Bombay?

A.—Yes.

Q.—In your opinion, and speaking from your experience, was that a correct procedure to adopt?

A.—It was something on the lines of what was being done in England at that time. Special men were being imported, who had been found to have proved their value during the war, and given enormous responsibilities. If the Government of that day thought that they had found men outside who would do the work better than the officials at their disposal at that moment, it was within their discretion to adopt this unusual procedure. I am not in a position to judge whether or no that discretion was wisely exercised at that moment.

Q.—So, you do not express any opinion as to the correctness or the appropriateness of that procedure?

A.—No. As a humdrum official, my sympathies are all with the ordinary Department. In the Service of Engineers in India we have an extremely able and powerful body of men.

Q.—Why were not the services of these men requisitioned for this work?

A.—I cannot tell you. I assume that the authorities of that day thought that they had found something far superior to what was available in the ordinary Service of Engineers. My own experience of the Service of Engineers is that they have proved capable in India to undertake the very highest responsibilities, but beyond that I cannot go in judging the discretion of the Government in 1919.

Q.—In that Department there was a permanent staff which looked after the usual routine and technical matters?

A.—Yes.

Q.—Did not the Government take a risky step by dispensing with the service of such a staff—let alone the Departmental officers?

A.—They set up a special machinery.

Q.—A Commission or Department without any traditions?

A.—To fill those posts they imported, to a certain extent, their own officers from other Departments, and they recruited a certain number of officers from outside.

Sir Frederick Hopkinson.—Would you describe it, putting it shortly, as a big jump in the dark?

A.—No. I would not describe it in those words which you have used. It was a break away from precedent in India, but it was action of a character that was being taken continuously through the war in England and elsewhere, and we were at the moment under the influence of those special war conditions.

Sir M. Visvesvaraya.—The circumstances and atmosphere were peculiar then, in your view?

A.—Yes.

Q.—Could not the work have been equally sufficiently done, with the aid of experts, perhaps, by the Public Works Department?

A.—My sympathy is all with the Public Works Department. I think they are a very capable body of men.

Q.—So you are inclined to the view that it was a mistake to have created a separate Department for this one work?

A.—I cannot go further than I have said. I am not prepared to say it was a mistake. I say that it was an act of discretion of the Government at a time when I was not associated with it.

Q.—Were all the members of the Executive Council kept informed of the progress of this scheme?

A.—At what date?

Q.—In your time—when you were there?

A.—All the members of the Executive Council—no. We are divided up into departments. We cannot carry on our several responsibilities if we are constantly ascertaining what our neighbour is doing. We have to have departmental responsibility very clearly defined.

Q.—But, in the case of a scheme like this, do not you take counsel together?

A.—On any large problems that arise the Governor is entitled to the advice of all the members of his Council.

Q.—Is it not binding on him to take the advice of all the members of the Council?

A.—No.

Q.—Even on such a big scheme as this?

A.—The powers are laid down in certain published rules, which I am afraid I must refer you to.

Q.—I want a statement of fact—whether the Governor is or is not bound to take the advice of all the members of his Council in sanctioning a scheme of this magnitude. Is he not so bound under the rules?

A.—There again you come up against the Budget and the Budget procedure. The Budget is placed before all the members of the Executive Council when the Budget is discussed.

Q.—The Budget, in a general way, comes under administration. That is the time when all the differences are brought forward?

A.—I am not speaking of the Budget before the Legislative Council. I am speaking of the discussion of the Budget in the Executive Council.

Q.—It is brought before them at that time?

A.—Yes.

Q.—Otherwise it does not concern all the members to sanction it?

A.—No particular problem is likely to concern other members than the administrative head of the Department.

Q.—That is all. Were the Ministers kept informed of the progress of the work, or they did not count at all?

A.—They took part in the Budget discussion at the Executive Council.

Q.—Do the Ministers take part in the Executive Council in discussing the Budget?

A.—The whole of the Budget is discussed by the Cabinet, including the members and Ministers equally.

Q.—That does not entitle them to enquire into the individual schemes on that occasion, except, perhaps, their financial aspect?

A.—Well, there is a very free and full discussion on any point which any member wishes to raise.

Q.—You did not answer one question I put at the beginning very clearly, namely, whether the regular project estimates for the scheme were commenced after preliminary sanction was given to the 400 lakhs estimate. Did you take that sanction as a sort of general authority to commence the work on, or did you rely on the estimates as giving complete cost of the whole scheme? In the correspondence it was stated that the regular project estimates were commenced after the work had been in progress for 18 months. Are you aware whether this was the case?

A.—May I ask whose statement is that?

Q.—You may read it in the second report of Sir George Buchanan, in which he agreed to a detailed estimate in February, 1922. His original report was in 1919. So that the detailed estimates were not prepared until about 18 months to two years had elapsed. The revised estimates were prepared in May, 1922, and sanctioned by the Government in October of that year?

A.—They must have been begun before May, 1922.

Mr. Billimoria.—Yes, the revised estimates must have been before that, because the original report was in 1919.

A.—I am sorry if I have not answered that question clearly, but, as I understand the sequence of events, the estimate of 4 crores, or 400 lakhs, was in October, 1920.

Sir M. Visvesvaraya.—That is right.

A.—The Development Department was created and came into being in November, 1920.

Q.—About the same time?

A.—Immediately after Sir Lawless Hepper and his officers were constituted the Department.

Q.—It was formally constituted on November 18th, 1920?

A.—Sir Lawless Hepper and his officers were appointed then.

Q.—Yes?

A.—Then the first business they were concerned with was the preparation of these detailed estimates.

Q.—When you sent up the estimate for 4 crores, did you say that the detailed estimates would be prepared later? Or did you give the Government of India the impression that they were the final estimates and that they were complete and correct? I want to know what your view is from your knowledge of the circumstances of this project?

A.—Again I must say I was not in India in 1920 when the project was made or dealt with of 4 crores.

Q.—You have been through the correspondence about it. You have been meeting the views of the critics of the scheme so often that I thought you might know all about it?

A.—This point is not within my recollection.

Q.—I want to know why the statement was first made that the 4 crores estimate was to be sanctioned, and then later on why it was stated that the detailed estimates had to be commenced after the 400 lakhs estimate was sanctioned?

A.—You have the explanation of that in that the 4 crores estimate was prepared by Sir George Buchanan. When Sir Lawless Hepper came on the scene he found that the estimate was not in sufficient detail. He thereupon prepared revised estimates, with the help of his officers, and those officers, I assume, must have taken 18 months to prepare those estimates in full detail, and those estimates are finally sanctioned in October, 1922.

Sir Frederick Hopkinson.—Do you suggest that an estimate of that kind should take 18 months to do?

A.—I am afraid I am not able to tell you whether that was the time taken, but there were a very large number of hands through which these details went.

Q.—An estimate made in January one year is very often invalidated by June of the following year by alteration in prices.

A.—Yes. I am not aware of the progress of events in regard to those estimates in those years.

Sir M. Visvesvaraya.—There are two or three important allegations on which I should be glad if you would favour us with your views. One is that the work was started on insufficient investigation and preparations. What is your opinion upon that point? Was the work started on insufficient investigation or not?

A.—Well, may I ask if the Committee have had before them the statement that I made to the Legislative Council on the subject of the Budget debate in 1923 or 1924?

Sir Frederick Hopkinson.—I should very much like to see that. I have been looking for it, and cannot find the one you are speaking of now. The first we have got is 1926.

A.—Have not you got the Budget debates of the earlier years?

Sir Frederick Hopkinson.—We have only 1925 and 1926.

A.—I see. I did give my view of the inception of this project in the speech that I made to them. I wrote the speech. I was actually ill in hospital, and it was delivered by Mr. Cadell in February, 1924.

Q.—We will try and get that from the India Office.

A.—I believe I have got it here. It is February, 1924. That is the one I refer to.

(*Document handed in by the witness.*)

Sir M. Visvesvaraya.—Could you put that statement in a few words for us?

A.—Well, I put it as briefly as I could then.

Q.—I want to know whether the work was started on insufficient investigation and preparation or not? I want you to give us your view generally on that.

A.—Well, I will have to go into rather a lengthy history, I am afraid. The idea of relieving the congestion at Bombay started 30 years ago in 1897, when the plague first came to India. The Improvement Trust was started then.

Q.—I mean the preparation for this scheme, or this project. What steps were taken to carry out a complete investigation before recommending this particular scheme? That is what I want to know. We are not concerned with the earlier stages.

A.—But I think you must be concerned with it.

Q.—Everybody knows about the origin of the Improvement Trust.

A.—They do not. I am perfectly certain that the gentlemen who are sitting here (the witness pointed to the Press table), who are the most important people in the Empire, do not know.

Q.—Very well, perhaps you will state it, and they will appreciate it, and we shall also understand it.

A.—Well, as I say, Bombay was visited by the plague in 1897, and the City Improvement Trust was started in that year by Lord Sandhurst. That was to relieve congestion in the slums and to turn the population gradually away to the north of the island. That work has been proceeding very slowly for 30 years. After Lord Sandhurst, 25 years ago, every Governor who has touched the question has had his mind directed towards enlarging the island at the southernmost point, rather than pushing on with the original scheme of diverting the population to the north. Governor after Governor has discussed this question. Lord Lamington pressed it on the attention of Lord Sydenham, and Lord Sydenham left it to Lord Willingdon, and Lord Willingdon left it to Lord Lloyd.

Through all those successive Governorships the matter had been examined by numerous engineers. It came to a very clear point in 1908, when Lord Sydenham sent up a scheme to the Government of India.

Q.—I remember that.

A.—Yes.

Mr. Billimoria.—When you talk of numerous engineers, could you give us any names, because so far as any records go, no other engineers were consulted beyond Mr. Kidd and Sir George Buchanan. Who were the engineers who were consulted?

Sir Frederick Hopkinson.—There was nothing about engineering in connection with the scheme until 1912. At least, we have not got anything in the records.

A.—1912 was Lord Willingdon's time. Lord Sydenham, as you gentlemen are aware, was himself on engineer, and he went into the question in great detail in 1907 and 1908.

Sir Frederick Hopkinson.—Lord Lamington had it in 1907 apparently?

A.—You are quite right—Lord Lamington in 1907 and Lord Sydenham came in 1908. Is not that right?

Sir M. Visvesvaraya.—About the end of 1907?

A.—Yes. I have here a letter from Lord Sydenham which might interest you: 'I took up the Back Bay project as soon as I had time, because Lord Lamington urged it upon me. With the assistance of Cameron, who was chief engineer in the Public Works Department at that time, and Mr. Kidd, the whole scheme was worked out in detail, and I examined it most carefully as an engineer."

Sir Frederick Hopkinson.—That would be 1912.

A.—1908, I think—between 1908 and 1912.

Q.—It was in 1912 that Mr. Kidd did it. Mr. Kidd made borings in 1912.

A.—Lord Sydenham became Governor in 1908, and he says he took it up as soon as he possibly could, and that would be in 1908. Then he goes on: "I trusted Mr. Kidd's careful examination of the available stuff in the harbour, which, of course, I could not check." You have no doubt seen Mr. Kidd's report and the chart of the harbour.

Sir Frederick Hopkinson.—Mr. Kidd's report is the basis of all the work which has been done. It has never been checked to this day.

Sir M. Visvesvaraya.—I was referring to the point as to the investigation being insufficient. To this day the engineers are relying on the results of Mr. Kidd's surveys. No further surveys have been made since 1912.

A.—Well, that is an engineering point which Sir Frederick Hopkinson will advise you upon. My opinion is worthless, but is it suggested that the bottom of the harbour has changed in its character in those years?

Q.—No, it is suggested that the investigation was not sufficient, and that the surveys were not complete.

A.—Well, I personally examined Mr. Kidd's chart, but not being an engineer I am unable to say.

Sir Frederick Hopkinson.—I think what the chairman means is this: that Sir George Buchanan, when he went out, took Mr. Kidd's report holus-bolus, and never examined it or checked it in any way at all, and that report of Mr. Kidd is the basis of the entire scheme as it exists to-day.

A.—I should think that is very probably correct. You asked me whether I considered that sufficient or insufficient. My opinion upon that point is valueless.

Sir M. Visvesvaraya.—Do you not think that it was such insufficient investigation that led to the project being under-estimated at the time?

A.—I do not know that my opinion on that point is worth anything.

Q.—Are you aware that if the Government had gone into the project very carefully they would have found that the reclamation might have been completed by dry filling cheaper than it is likely to cost now? We have had several witnesses before us who have testified to the fact that for about 5 crores you might have completed the scheme without resort to any scientific appliances like the dredgers. If this question had been fully investigated at first a good deal of trouble might have been saved. Is it not so?

A.—I think I must assume that it was investigated, and that the reports were that filling by means of suction dredgers must be cheaper and quicker than filling by dry filling by trains.

Q.—It would be cheaper at 367 lakhs, but it was not cheaper when you sanctioned an estimate for 702 lakhs?

A.—Well, I cannot tell you.

Q.—You are aware that the Government had been committed to the purchase of the dredger before sanctioning even the first scheme of 400 lakhs. Are you aware of that or do you want to refresh your memory on that point?

A.—That may be technically correct, but I do not suppose that is correct in the broad sense. The Secretary of State's final consent to the scheme may not have been received, but the Secretary of State's approval was behind the scheme before the dredger was ordered.

Sir M. Visvesvaraya.—That may be so. We do not know exactly what passed about that. I only want a statement of fact recognised, namely, that the dredger was ordered before the scheme was sanctioned.

Mr. Billimoria.—Officially sanctioned?

A.—Before the technical sanction was received?

Sir M. Visvesvaraya.—Yes.

A.—I believe that is so.

Q.—If the Government had not committed themselves to the purchase of the dredger they would have found that a dry filling scheme for five crores would have been much more satisfactory than a 702 lakhs scheme to which they committed themselves later?

A.—I very much doubt it. I very much doubt whether a five crores scheme with dry filling is at all possible.

Q.—We have got before us evidence of engineers given in Bombay?

A.—Very well.

Mr. Billimoria.—That would be an engineering question.

Sir M. Visvesvaraya.—It is a very important question. You have about 29 million cubic yards of earth work to do and at about Rs. 1.5 per cubic yard the cost of filling would be Rs. 435 lakhs. With the sea wall added the cost might come to something like five crores. You may accept this because the Commission has been supplied with evidence by previous witnesses.

A.—Very well.

Q.—So that the commitment of the Government to purchase dredgers before the scheme was sanctioned has led to subsequent heavy losses?

A.—On the working of the dredger up to date—not if the dredger had worked as it was estimated by the makers that it would work.

Q.—As estimated in the original 400 lakh scheme you mean?

A.—Yes.

Q.—Did you consider when you sanctioned the 702 lakhs scheme that dry filling would be more costly? Did you go into that question at all?

A.—You are talking of at that time?

Q.—If you take it one rupee eight annas per cubic yard?

A.—Yes.

Q.—You may be surprised to learn that Sir Frederick Hopkinson holds that it is likely to cost one rupee not one rupee eight annas per cubic yard if the matter is properly gone into.

A.—I am very glad to hear it, but on the figures that were before the Government the dredger filling would have been one rupee three annas a cubic yard. Is not that so?

Mr. Billimoria.—Five annas a cubic yard?

A.—One rupee three annas is what it was raised to.

Q.—The original estimate was five annas.

A.—Do you say one rupee eight annas a cubic yard would be preferable to the dredger if it worked at five annas a cubic yard?

Sir M. Visvesvaraya.—The cost of the dredger is a crore and a half, and therefore the whole cost has gone up. If you had not committed yourself to do the work by dredging you might have completed the scheme for four or five crores. As it is, the final scheme might cost 10 or 11 crores if it is to be completed.

A.—With dry filling?

Q.—Yes, so the work which might have been completed in the ordinary way for five crores we will be doing with scientific appliances at a cost of perhaps 11 crores. That is the position. That is what the public seems to be up against.

A.—Those figures have been reported since I left India, and I have not seen them. I find it a little difficult to follow them. Perhaps you can give me any particular point on which you want information from me.

Sir Frederick Hopkinson.—Perhaps I can help you on this point. Sir George Buchanan's estimate in 1918 said that he was going to do the whole of the pump filling for eight annas a cubic yard. The provision of the machinery alone divided by

the quantity of work to be done cost approximately 12 annas a cubic yard before he commenced dredging.

Sir M. Visvesvaraya.—Five annas was the estimated working cost.

Sir Frederick Hopkinson.—No, five annas is the original cost in 1912. Eight annas was his cost in 1919, including everything. The provision of the machinery alone cost 12 annas before he had dug a single yard. That is the position.

Sir M. Visvesvaraya.—A new Department having been created, we find from the reports in the Department that the question of appointments was left practically to the consulting engineer. The purchase of materials was also left to him and to the engineer on the works who was his subordinate, and who practically was his nominee?

A.—Yes.

Sir M. Visvesvaraya.—Was it right to trust responsibility to a person who had no stake, and on whom the Government had no hold?

Sir Frederick Hopkinson.—All the purchases were made through the director of contracts in London.

Sir M. Visvesvaraya.—No; there is no report by any other person except by the consulting engineer and his assistants. That would not have been the case had the work been carried out by the Public Works Department. Perhaps you are not prepared to express an opinion on that. All I say is: was it right to entrust such great responsibility to persons in the temporary employ of the Government, or who were doing business with the Government in a temporary capacity?

A.—If you employ contractors you give them very great powers.

Q.—But in this case the responsibility was not limited by the rates which govern a contract. But in the present case the responsibility was all on the Government and the work was done at the will of the consulting engineer and his officers. You said all the trouble had arisen mainly from the failure of the dredgers?

A.—Yes, that is the main point on which the whole thing pivots.

Q.—What steps did the Government take when they discovered that the dredgers were not giving the required output?

A.—Well, it was discussed between the director of development, Sir Lawless Hepper, and Sir George Buchanan, the engineer controlling the work from London.

Q.—What did it lead to? What practical action did the Government take in order either to improve the work of the dredgers or to adopt any new policy in carrying out the works when the difficulty came to light?

A.—There have been only two years' working.

Q.—But two years is a long time Interest is accumulating at the rate of about 30 to 40 lakhs per annum.

A.—When I say two years' working seasons, I mean from November to May. That is the whole of the working season. The results of the first working season were reported in August, 1924. They were discussed with Sir George Buchanan, who advised the Government that a machine of this complex character could not be expected to work well in the first year.

Sir Frederick Hopkinson.—Did he actually say that?

A.—Well, not to me.

Q.—Did he say that to the Government?

A.—That is the information that reached me—and that the crew were not experienced and had to be trained to it. There were some difficulties with the crew. Some of them had to be replaced, I understand, because their work was unsatisfactory in every way. Fresh men had to be trained in the following year.

Q.—You have no definite knowlege of that?

A.—No.

Sir M. Visvesvaraya.—I do not think you ought to say that.

Mr. Billimoria.—Was that at any stage mentioned in any of these official reports by Sir George Buchanan?

A.—Which statements?

Q.—The statements you have made either about the crew or otherwise. Did he make any statement in any of these official reports? We do not find anywhere that he did, but, on the contrary, he says: "The crew worked very satisfactorily."

A.—Well, I do not know what he may have written. These reports were not shown to me, but my own information is that the crew were not working satisfactorily.

Sir Frederick Hopkinson.—As a matter of fact, the reason the dredgers could not work the first year was because they had not got the crew there. They had not got a

sufficient crew there. They had only got enough men to work the dredger a single shift for the whole of the first year?

A.—Well, I take that from you, Sir Frederick; but I went on board the dredger several times, and my impression was that some of the men were giving trouble. I give that to the Committee for what it may be worth.

Q.—That is not an uncommon thing since the War?

A.—Quite. It is very common; but we have rather drifted away from the question which you put.

Sir M. Visvesvaraya.—I want to know when they found the work of the dredger unsatisfactory, what steps were taken by Government to improve its efficiency?

A.—Well, as I was saying, at the end of the first season in August, 1924, the Government were advised by Sir George Buchanan that the first year's results could not be accepted as a guide to the final results. Therefore, we waited for the second year's results, and those second year's results were worse still. Now we have got the third year's results, and those results are not within my knowledge officially.

Q.—They are more favourable.

A.—They were reported after I left India; but I understand that at the end of the period, from April, the last six weeks, they were very much more favourable.

Mr. Billimoria.—They were more favourable, but not very much more favourable.

A.—Not for those six weeks?

Q.—The dredgers were expected to give about 5,000,000 cubic yards per annum. The maximum they have given so far is 1,800,000 cubic yards.

A.—That is this last year?

Q.—Yes.

A.—I want to be a little more clear on that point. Is it not the case that from April last, in the last six weeks, the work was very much better than in any other part of the whole period?

Q.—Comparatively, it is so.

A.—What is the figure per hour for the last six weeks?

Sir M. Visvesvaraya.—The figure for the last season averaged about 950 cubic yards per hour.

A.—As against 600 in the first year and 460 in the second year?

Q.—Yes.

A.—So that it is more than twice as good as the second year?

Q.—Yes; and it might be better.

A.—I want to drive home this point. It is twice as good in the close of this last season as the average of the year before.

Sir Frederick Hopkinson.—You must take these figures of six weeks with a grain or two of salt.

A.—Oh, very well; but you have, no doubt, noticed that the bonus system was introduced from the 1st April, and that coincides with this improvement. Whether it is an accurate and genuine improvement, I do not know.

Sir M. Visvesvaraya.—Do you happen to know why no guarantee for the efficiency of the dredger was obtained in placing the contract with the builders? That is a very important point, is not it?

A.—No; I do not know that. It is 1919.

Q.—When the dredger failed to give satisfaction, did not you take steps to ask the manufacturers to put it right?

A.—I think you have had that evidence from Mr. Cowasjee. It was done by Mr. Cowasjee in his department.

Q.—He has not given any definite answer on this point.

A.—I have only got rather remote knowledge that there was correspondence with them.

Q.—It is now recognised that the scheme is a failure, is it not?

A.—I do not know. That is for you to say.

Sir Frederick Hopkinson.—That is anticipating our report.

A.—And what is a failure? What do you mean by a failure?

Sir M. Visvesvaraya.—The Committee in Bombay, which went into the scheme last month, have stated that the completion of the scheme is not now a practical financial proposition. I do not know what your view is.

A.—Let us have the figures.

Sir Frederick Hopkinson.—We do not accept them.

Sir M. Visvesvaraya.—I am just asking what your own view is as to the position of the scheme, under the circumstances we have discussed, up till now. Do you consider the scheme a success, or is it still on its trial, or is it a failure?

A.—I say it is still on its trial. I have not seen the last reports, but the word "failure" is, I think, premature. It is all a question of what it is worth while for the Government to pay for this enormous increase to the business quarters of Bombay.

Q.—But the value of the land has gone down very considerably.

A.—At the moment, yes; so has the value of the cotton mill shares. One depends on the other. But the cotton mill shares are going to move up again, are not they?

Q.—Have you any suggestions to make with regard to the future of the scheme in the present circumstances?

A.—Do you mean as to completing it or not?

Q.—We have to make our own recommendation, and we want to know what you, as an administrator, think should be done?

A.—1 and 8 are practically completed.

Q.—1 and 8 are practically completed.

A.—What about 7?

Q.—That is under discussion. Opinion is partly in favour and partly against it.

A.—I should say that it would be wise to go on with 7 as rapidly as possible this next season with the dredger.

Q.—You think so?

A.—Yes; complete the sealing of the wall, and pump in with the Sir George Lloyd dredger throughout this next season. It is shallow land, as you know. You know the depth varies very much from $3\frac{1}{2}$ cubic yards to the square yard in No. 8. In No. 8 it is about $3\frac{1}{2}$.

Q.—That is the average depth?

A.—That is cubic yards to the square yard.

Q.—It may be so.

A.—In No. 5 it is 7 cubic yards to the square yard.

Q.—Not so much; it is about 5 or 6.

A.—No; it is over 6, in my recollection. In Nos. 4 and 5 it is between 6 and 7. You have got that in the interim report. In No. 7 it is very little over 4. Obviously, it will be much cheaper to do No. 7 per square yard than 4 or 5 or 6.

Q.—Nos. 3, 4, 5, or 6 are hopeless for the present?

A.—I would not say they are hopeless; but, at any rate, they are more expensive than No. 7.

Sir Frederick Hopkinson (to the Chairman).—I do not think you ought to give expression to an opinion of that sort,

Sir M. Visvesvaraya.—Why not?

Sir Frederick Hopkinson.—It is rather anticipating our report.

Sir M. Visvesvaraya.—I want to let the Witness give his view. We may or may not accept the evidence on the point. What other blocks do you wish to see completed?

A.—You have to go on with No. 1 this next winter, and now we are going step by step. It is very important that you should carry on with No. 7 immediately.

Q.—It is stated that No. 7 is not a thoroughly sound financial proposition?

A.—I do not believe it, when there is less than half as much filling in No. 7 than in the blocks higher up.

Q.—And the others?

A.—That will take you through next winter, and if the dredger works fairly satisfactorily next winter, say, at the rate of 950, which it is said to have been working at at the close of last season, then you can think later on what to do with regard to the dredging of the other portions. In any case, I regard it as of the most immense value to Bombay that as much as possible of this reclamation should continue. I would like your Committee to consider the geography of the island. It resembles New York in its geographical position, and you, Sir, who know New York, know how immense the traffic problem in New York at the present day is. You know that Bombay City is going to get into the same condition as New York and will not have the same possibility of lateral alleviation as New York has. You know the value of land in Bombay City during a period of time rose to the same value as land at the Bank of England here. Do you know that, because that is so, if you work out these figures?

Q.—It is very high indeed. The highest rents in Bombay are sometimes higher than they are in London.

A.—That is throttling the trade in Bombay. It is throttling the life of Bombay. It is the hold that a small group of landowners in Bombay City has on the trade of

Bombay that is the greatest danger to the life and prosperity of Bombay in the future. Here is an opportunity for doubling the whole of the business quarter of Bombay and shifting it a bit more out here to the west and avoiding the traffic problem of New York, diminishing the cost of all mercantile and commercial life in Bombay and making the future prosperity of Bombay. To value that in terms of 20 or 30 or 50 rupees a square yard is, I think, unwise.

Q.—Would you not leave the work as it is and take it up after four or five years, when again prosperity returns to Bombay? In the meantime interest will be accumulating, and Bombay is in distress now financially?

A.—That, I think, is a question which will have to be decided in the light of further experience. I am very doubtful whether the experience that we have got up to date is sufficiently sound and certain to form a final judgment upon it.

Q.—I have only one remark to make now. If you wish to give any information or explanations calculated to remove misapprehensions in the course of examination by my colleagues, we will welcome them.

Sir Frederick Hopkinson: I understand that the only means of communication as to the progress of the works from the Government to the public generally has been the Annual Reports of the Development Directors?

A.—No; there are the Sessions of the Legislative Council. During these Sessions any member of the Legislative Council can raise a debate on any point of public interest. There have been debates on questions affecting the Bombay Development Department. In those debates the member of Council affected has to give his reply and enlighten the public.

Q.—But nothing in the nature of a general detailed report would be given on those occasions?

A.—Papers may be presented.

Q.—But have they been presented, do you know?

A.—I think they have, but I could not be certain.

Q.—My impression is that the only reports have been those of the Annual Reports of the Development Directorate to the end of the financial year?

A.—That is possibly the only official communication to the public, if you exclude as valueless the discussions in the Legislative Council.

Q.—I have no knowledge of them, so I cannot exclude them as valueless.

A.—There are very frank expressions of opinion by some members who have appeared before you.

Q.—Those very frank expressions of opinion would not be anything in the nature of a Report from their Government?

A.—They would draw forth a Report from the Government. They have to be replied to and explained.

Q.—I want to suggest that the Reports of the Development Directors on the Back Bay Reclamation Scheme have been extremely meagre. Do you agree with that? You know them, of course?

A.—I have seen them.

Q.—Would you describe them as full?

A.—I am afraid I do not remember them. They appeared at a time when the Finance Department was rather pressed, and, beyond a cursory reading of them, I did not form a very definite judgment of them, I think.

Q.—I will just go through two or three of them. For the year ending March 31, 1921, in July it was stated that the cost of land values for building would in June, 1929, be 28 rupees a square yard. For the year ending March 31, 1922, it was stated that the detailed estimates were practically completed and they show no real difference from those of last year, namely, 28 rupees a square yard, but probably the actual figure would be less.

A.—The figure of what?

Q.—Of 28 rupees a square yard?

A.—That was stated when?

Q.—March 31, 1922. Then in February, 1922, it is stated that 50,000 chawls—that is, single-room tenements—have been reduced from 50,000 to 17,000. Can you tell us why that was done?

A.—That does not come into Back Bay?

Q.—No, but I am going to bring it in in relation to Back Bay. Before I do that, can you tell us why that was done?

A.—Yes; the prosperity of the cotton mills had fallen off very greatly. There was far less employment in Bombay. Masses of people who had migrated into Bombay are

believed to have left in very large numbers, and the population for which those chawls, or tenements, were being built was found to be very much smaller than was anticipated when the scheme was started.

Q.—In other words, the scheme was started when Bombay was flooded with population?

A.—Yes.

Q.—I believe in one case they said the provision of these extra chawls was in order to put in half the population of Bombay?

A.—If that was stated it was somewhat of a wild statement.

Q.—I do not think so. This is in the Development Committee's Report of 1922: "The population provides for 600,000 new immigrants and it is stated half the present population."

A.—What provides for 600,000—I do not follow it?

Q.—New chawls. I suppose it means the population to be provided for by the new chawls is 600,000.

A.—It is a very badly written sentence.

Q.—I will have the exact sentence looked up. It is for the year 1922. It goes on and says: "In addition, a large population will be accommodated in other schemes." This is the exact wording of it: "On a conservative basis the figures may be taken as under." And then it gives three schemes: "Back Bay, 50,000; Housing Scheme, 50,000; Tenements, 250,000; Suburban Schemes already notified, 300,000, making a total of 600,000 or about half the present population of Bombay." That is the official document.

A.—May I see it?

Q.—Certainly. (*Document handed to the Witness.*)

A.—I do not understand about the Housing Scheme. The figure I found difficult to understand from you was that the Housing Scheme, 50,000 tenements, should provide for 600,000?

Q.—Yes, it is only a portion of it—it is 250,000.

A.—Yes, there are five persons taken to a tenement and I could not understand 12 persons being taken.

Q.—You see what they are providing for. I am going to suggest to you that possibly the public were alarmed by a sudden drop from 50,000 to 17,000 tenements, showing that the estimate of requirements was hopelessly wrong, and that it was made at a time of scare without consideration to the probability of the peak falling?

A.—Yes. You say that was a probable cause of public alarm?

Q.—Yes, and that probably alarmed the public also in connection with the Back Bay Reclamation Scheme—that a thing had been started that was started without due consideration, in the same way that they started these 50,000 tenements.

A.—Well, there may have been some connection in the public mind between the two, but the two are quite distinct.

Q.—I agree.

A.—The Housing Scheme is in a totally different quarter of Bombay.

Q.—That is what I wanted to get at. You said just now that the purpose of this Back Bay Reclamation Scheme was the improvement of the conditions of the poorer classes?

A.—Yes.

Q.—I wanted to see how you connected that up?

A.—Well, we must deal with the general economic condition of Bombay City. Bombay City depends very largely on its cotton mills. The profits of those cotton mills before the war were about two and a-half million pounds a year. During the war, and for a year or two afterwards, they went up to over ten million sterling, or fourfold. That money very largely poured into the pockets of the middle classes of Bombay. Those classes became richer and richer than they had ever dreamed of being in their lives. They began to migrate out from the congested areas of Bombay into all the possible surrounding tracts. A very considerable number have migrated out of Bombay into the hinterland. Others came up on the hills, Malabar Hill and Cumbala Hill, and then went into other parts—in the northern part of Bombay.

Q.—That is the middle classes?

A.—That is the middle classes. An enormous amount of building went on. They vacated their houses, which became available for the classes immediately below them. There was a regular move up of the standard of life, and the poorest classes, in the end, benefited by there being rendered available for them accommodation which would not have been available otherwise.

Q.—What I did not understand was why the Back Bay Reclamation Scheme would improve the condition of the poorer classes?

A.—Because it will provide accommodation for the residence of large numbers of people near their business, which will again make a wider space in the congested areas.

Q.—It is remote, not direct?

A.—Not absolutely direct.

Q.—It is remote. Having regard to the cost of the Back Bay Reclamation Scheme, do you believe the middle classes would ever be able to afford to live there?

A.—I do not know. If you knew the conditions under which they are living now in the centre of Bombay——

Q.—They may be bad, but the cost of the Back Bay site will be so heavy that I doubt if the middle classes will ever be able to live there?

A.—Yes, but people will spend on rent in India, in these conditions, a larger proportion of their total livelihood than they will do in England.

Q.—But they cannot spend more than they have?

A.—That is true.

Q.—To go to another matter, I thought I understood you to express the opinion that the dredger was the crux of the whole scheme?

A.—I think so.

Q.—The dredger arrived in Bombay in March, 1922, and it commenced working in December, 1923, having been idle for a period of about 20 months. It then started work having only enough crew to work at a single shift until the end of that season, which was about May, 1924. The reports of this work done, you said, were communicated to the Government in the following autumn—about August. Can you tell me why the Government did not get reports of the work done earlier than that?

A.—This is August, 1924, is it not?

Q.—Yes, August, 1924?

A.—I am sorry I was not in India then.

Q.—Were you not in India in the following year?

A.—Yes, 1925.

Q.—The same question applies to the following year. Why did they not get the reports before the autumn?

A.—The autumn is perhaps the wrong word.

Q.—You said autumn first, and then August was mentioned. August is after the end of the working season?

A.—Yes.

Q.—It is some three months after the end of the working season?

A.—Yes. I understand various calculations have been made by the engineers which would take them a considerable time into June. Those calculations drift up through the various departments, through the Director of Developments to the member in charge, and I think they would reach him about the middle of July, or thereabouts—I speak subject to correction, but that is my impression—and the other members of the Government would hear about it after that.

Q.—In August?

A.—Generally at the end of July they are having the Legislative Council Session, and the ordinary business has to lie dormant. When that is over we get back to normal administration.

Q.—I understood you to say that you were not able to mention the matter to Sir George Buchanan till after August, 1924, for the reason that you had not got the information?

A.—I do not wish to pin myself to that date at all.

Q.—The Autumn?

A.—Well, I do not know. I was home, sick, all that time.

Q.—Then take the next year. My question applies to both years?

A.—1925, you mean?

Q.—Yes. I think it was communicated to Sir George Buchanan as soon as Mr. Cowasjee——

Q.—The first year it was communicated to him, and he said : " It is nothing to go by. We have only been working a whole season. You cannot judge a dredger of this kind on a whole season's working."

A.—That is what I understand.

Q.—Then next year you could not communicate with Sir George Buchanan until after August?

A.—Yes, I think so. That correspondence does not pass through me. I only have an indirect knowledge of it.

Q.—As a member you would know pretty well what was going on?
A.—Generally speaking, yes.

Q.—May that be taken as the measure of the control exercised by the Government of Bombay—to wait results from December until August with a valuable plant costing one-and-a-quarter million sterling? The dredger began in December?
A.—Yes.

Q.—You did not get any results until the following August? Therefore, you could not do anything on those results until three months after the season had ended. I ask whether that may be taken as the measure of control exercised by the Bombay Government?
A.—Well, this is not a very easy question to understand.

Q.—It is a very difficult one to answer, I am afraid.
A.—Well, the Bombay Government consists of various portions.

Q.—I am speaking of the Government as a whole?
A.—From December, 1923, I believe, Sir George Buchanan was for some time on the spot, and he and Sir Lawless Hepper, the chief engineer, would be watching the work of the dredger, so that, in so far as they represented the Government of Bombay, they were not waiting until August, 1924, to ascertain how the dredger was working.

Q.—They may have been watching it, but you do not get any results till August. You can go out and watch a thing till you are black in the face and it will not tell you anything. What I want to know is, why did you not get results before August? Why did you not get results the next week?
A.—That is a question you must ask the engineers. I have no doubt you have asked them. We had to depend on our engineers, who told us they could not give us any infomation until the end of the season.

Q.—Were you satisfied with that explanation?
A.—We had to rely on our engineers in matters we did not understand.

Q.—Surely you can understand the question of measuring up the work done? It does not need any great knowledge to understand that. Surely the Government can say, " You have dug a hole, now measure it up. What does it consist of, and how much has been dredged out of it?"?
A.—As far as I know, that is left to the administrative head of the Department.

Q.—This dredging plant is the crux of the entire scheme, a scheme which is going to cost 702 lakhs. Yet the Government of Bombay is so little interested in knowing how the heart of the machine is working that they wait till August to know what it did in the previous December? Is not that so?
A.—May I suggest that perhaps you think it is the Government of the City of Bombay. It is the Government of the Presidency of Bombay, with many pre-occupations.

Q.—I am thinking of the Government of the Presidency of Bombay?
A.—Very well.

Q.—Who are responsible to the general public for the whole scheme?
A.—Yes.

Q.—What I am suggesting is that you did not take any steps to find out how the work was going on when you could have done so quite easily. Is not that so?
A.—No; I say definitely it is not so.

Q.—I will put it to you in another way. The dredger has been working over a certain area, and for a certain period of time. Have not you got engineers who will take soundings of the amount of work done every day during that period, and could not you tell at the end of each week exactly how much has been done?
A.—That is the work of the responsible head of the Department.

Q.—Your servant?
A.—Yes.

Q.—I am asking you, why was not that done? Why was not the Government informed in January that the dredger was failing in its work in the previous December?
A.—That is a question to be asked of the Director of the Department.

Q.—No, it is not. I am asking you, as the representative of the Government, because you are responsible for the Director of Development. He is your servant?
A.—Quite so.

Q.—Here is the Government going on with its head in the clouds for eight months and not knowing whether the dredger was going to be a success or not, when they ought to have been able to tell after the first week or two. I was afraid you would find it a difficult question to answer.
A.—Well, that is your opinion—that we should have known from week to week?

Q.—It is not my opinion, surely? It is your opinion now, is not it? Surely it is your opinion now?

A.—We were told we must wait till the end of the season.

Q.—Why did you wait? Why did you accept such a statement? Why did you not say, " Go and measure it " ? Well, I am afraid you cannot help me any further on that?

A.—I say, that is the way in which the work and responsibilities are delegated.

Q.—I say to you, No; the Government of Bombay should have insisted upon knowing how this enormous work was progressing, instead of waiting until the end of the whole season, first the 1924 season and then the 1925 season?

A.—Very good.

Q.—It is too late in August to correct a mistake of the previous December, except for the future?

A.—Well, I take it that is your opinion.

Q.—When did the Government think first that the estimates were going to be so largely exceeded?

A.—Well, I suppose, when this estimate of 702 lakhs was brought forward.

Q.—Was the Government at all alarmed about that?

A.—No, I should think that the 702-lakh estimate was considered as well within the financial possibility of the scheme.

Q.—A scheme that would be a financial success at 367 lakhs would not necessarily be a financial success at 702 lkhs, would it?

A.—A scheme of 367 lakhs, which was likely to produce a profit of several crores of rupees could, even as a scheme of 702 lakhs, still be financed and prove remunerative.

Sir M. Visvesvaraya.—Did you prepare any statement of the financial results when you sanctioned the scheme, and, if so, what was the return that you expected?

A.—Well, it is four years ago now.

Sir Frederick Hopkinson.—It is a very important thing. Did you prepare anything in the nature of a balance sheet, showing what the Government was going to gain by doing this scheme?

A.—The figures were examined by the financial officers.

Q.—Can you give us the results? Have you anything in writing or in a paper?

A.—I have nothing in writing here, no.

Q.—Is there anything anywhere?

A.—There should be something in Bombay.

Q.—Have you seen anything?

A.—I cannot tell you now, but there must be something.

Sir M. Visvesvaraya.—We have not seen anything.

Sir Frederick Hopkinson.—As Financial Agent of the Government you would have seen it had it been in existence?

A.—My impressisn is that there were calculations made, and the conclusion was that the figure of 702 was still possible.

Q.—I do not think it carries us very far to say you have an impression that something was done. What I asked you was, was a balance sheet made showing the profits likely to accrue from the carrying out of this scheme? Was it made for the 367 lakhs estimate?

A.—If you have made these inquiries of the financial people, with the papers before them in Bombay, I am afraid I cannot add anything to what they must have told you.

Q.—You were responsible for the finance, were not you?

A.—Yes.

Q.—Cannot you tell us, was there such a thing as a balance sheet made?

A.—I have certain officers——

Q.—Was there such a balance sheet made? Did you see anything of the kind?

A.—Not what you would call a commercial balance sheet.

Q.—Nothing in the nature of a balance sheet?

A.—These things are reported according to the method of administration of the Government in India and are recorded in the Secretariat of the Government.

Sir Frederick Hopkinson.—But you do not say that that has been done, so we do not know that they have been recorded. I asked you definitely, was such a thing ever done? Surely, if it were done you would be the person who should know of it?

Sir M. Visvesvaraya.—Was a big scheme of this magnitude sanctioned without calculating the cost, that is, without preparing a financial statement?

Sir Frederick Hopkinson.—We are on something more than cost. It is the question of getting out a balance sheet and seeing whether it was a profitable scheme.

Mr. Billimoria.—We were told by some witness that certain forecasts had been prepared from time to time. They were not forthcoming before this Committee, but it was said they had some forecasts made from which they could estimate how the scheme was going to proceed—either profitably or otherwise. Did you see any of such forecasts? Were they ever submitted to you as the honourable Finance Member for the Presidency?

A.—Yes, forecasts certainly, but whether they correspond with what Sir Frederick is asking for as a balance sheet is another matter.

Mr. Billimoria.—Forecasts would give results of some kind.

Sir Frederick Hopkinson.—Here is a paragraph from the Second Interim Report of the Advisory Committee : " I have asked the Department whether any forecast was ever prepared of the period of disposal of the land or of the rate of sale per square yard, but it appears that the Government of Bombay never considered these questions at all." You have read this I presume?

A.—Yes.

Q.—Do you object to that?

A.—I do not think that is correct.

Q.—Perhaps you can tell us where we can find this information?

A.—I am not sure whether you examined the Financial Secretary in Bombay.

Sir M. Visvesvaraya.—We did not. You are at liberty to take a day or two and send us a statement on the point.

Sir Frederick Hopkinson.—But the witness has not said that he has ever seen such a statement?

A.—There were forecasts prepared to the best of my memory but what exactly are in those forecasts I find it difficult now to recollect. But there were officers in Bombay who could have produced before you whatever records there were.

Sir M. Visvesvaraya.—None were placed before the public for their information?

A.—No forecasts?—that I do not know.

Sir Frederick Hopkinson.—According to this report I have just read there is nothing of the kind in existence. It is Paragraph 61.

A.—I think this is a mistake " I have asked the Department whether any forecast was ever prepared of the period of disposal of the land or of the rate of sale per square yard." Certainly there were forecasts prepared for disposal of the land per square yard.

Q.—He says he was asking for them and he has not got them and you have not told us anything definite; you have only said you have the impression such things were done. I should have thought it was of the greatest importance that you should have had a balance sheet showing the advantage of going on with this scheme. Then when you got on to the estimate doubling the first one, you would see exactly what the exact chances were for the success of it. Your chances of profit, of course, would be reduced enormously. Then when you got another estimate running to another 400 lakhs or so, taking it up to 1,100 lakhs, you would be able to see what your losses were going to be.

A.—Yes. I do not think we can accept the statement in Mr. Subedar's report as showing that these forecasts were not prepared.

Q.—All you can tell us is you have not got them. You do not know beyond that?

A.—I have not got them here.

Q.—You do not know of them?

A.—I think I saw a forecast which did show a period of disposal of the land and rate of sale per square yard.

Q.—Surely that is a very important thing?

A.—Yes.

Q.—The Government would not surely go into a thing of this kind without having some idea of what the pecuniary result was going to be?

A.—Certainly

Q.—You are not able to give us anything of the kind, or refer us to anything of the kind?

A.—That is not quite a right statement of the position.

Q.—I do not want to get anything that is not right.

A.—I say you could obtain that information from the officers in Bombay who have those records in their possession. My recollection is that such records did exist.

Sir Frederick Hopkinson.—But it is only an impression.

Mr. Billimoria.—May I remind you in this forecast you have estimated the realisation of the land at 100 rupees per square yard?

A.—Then you have seen this forecast?

Q.—No, we are told about it, and we are told the land you are going to sell for 100 rupees per square yard, and therefore the scheme is a sound proposition. Is that your impression or is it otherwise? The land should be produced for 28 rupees a square yard and sold at 100 rupees a square yard, leaving a very substantial margin of profit on a modest estimate, 30 to 50 crores. That is the sort of view which has been expressed?

A.—Certainly not 30 or 50 crores.

Q.—That is exploded?

A.—It was never in the mind of the Government.

Q.—Supposing it was 30 or 50 lakhs, there must be some basis on which these figures were calculated?

A.—Yes. I am under the impression there was a forecast prepared at different times by different officers of the Government.

Sir Frederick Hopkinson.—We must leave it there as we cannot get it any further. We cannot get it beyond that you have that impression?

A.—You can ascertain that if you inquire from Bombay.

Q.—There has been a great deal of complaint in Bombay that the Government has not taken the public into its confidence over the construction of the Back Bay reclamation. Can you tell me, beyond these debates in the Council and the Annual Reports of the Development Directorate, if any other steps were taken to take the public into your confidence?

A.—What sort of steps do you suggest? There was an Advisory Committee appointed.

Q.—That was subsequent?

A.—That is from August, 1924.

Q.—Anything before that?

A.—No. The dredger began working in December, 1923, and up to then the operations of the Department, so far as regards the quarry and the wall and all that, all went very well.

Q.—They are all minutely described, but I am speaking of a precise thing which could be measured, which is the dredging?

A.—Quite so, but you accepted that up to December, 1923, the work was proceeding satisfactorily so far as the quarry and the wall were concerned.

Q.—I do not accept anything of the kind because dredging had not been started then, although the dredger had been there since March, 1922. Therefore I could not say in 1923 that it was proceeding satisfactorily. I should consider it most unsatisfactory?

A.—That the dredger did not work earlier?

Q.—Yes.

A.—I see. That is another point.

Q.—Certainly.

A.—So far as the engineering work on the wall, the preparation of the quarry and the stones, and so on, was concerned—so far as all that was concerned—the work was proceeding within the estimates and satisfactorily.

Q.—That I do not know. I shall know something more about that by the time we have finished, but I consider the construction of the reclamation wall was done in a most unsatisfactory method. My point is this. What you told the public in the March, 1923, report says that the work was proceeding smoothly practically according to programme, but it does not say except the dredging. It says: "The work of the Directorate proceeded smoothly practically according to programme"?

A.—Yes.

Q.—But the dredging had not been started then?

A.—No.

Q.—The programme was to be finished in five years, and the whole of the dredging was to be finished in five years. The dredger was there in March, 1922?

A.—Yes.

Q.—In those circumstances I suggest that is not a fair or accurate statement?

A.—Well, was it possible to start the dredger working before the wall was completed?

Q.—I say it ought to have been possible?

A.—Oh!

Q.—You knew you were going to get the dredger there in the spring of 1922. You knew the dredger was ordered in March, 1920, therefore you ought to have been ready to receive the dredger so that it might start work immediately it arrived. Surely

you would agree with that as a working proposition with a dredging plant costing 1¼ million pounds, on which the interest would come to £70,000 or £80,000 a year?

A.—Yes.

Q.—In the same report in March, 1923, the report goes on to say : " The policy is to push reclamation and housing with all speed." The dredgers all this time were lying idle, and for the whole of that year until December, 1923, they were idle?

A.—Yes.

Sir Frederick Hopkinson.—Then the next year, March 31, 1924, they simply gave a statement that the actual dredging was started and 500,000 cubic yards deposited, which came to 5,720 cubic yards a day against the estimated quantity for the dredger of 2,000 cubic yards an hour which, at a 15 hours' working day, would be something between 20,000 and 30,000 yards a day, so that the dredger was only doing less than a quarter of what it was expected to do. Then it goes on to say that " much better quality material than anticipated was being met with." But the complaint we have had at Bombay is that the material has been very much worse than was anticipated, yet here is the Official Report in March, 1924, saying it was much better than had been anticipated.

Mr. Billimoria.—In connection with this Report, may we get out from you whether the Government gave any formal sanction as to the publication of this Report, or whether it was simply on the responsibility of Sir Lawless Hepper that the Report was published? Was it with the approval of the Government, or was it his own document?

A.—No, it was never submitted to the Government before publication.

Q.—That would make your position as Finance member clear. For any statement made therein you are not responsible?

A.—No, I had nothing to do with those statements.

Sir Frederick Hopkinson.—The report further goes on to say that this material was so good that Sir George Buchanan decided that further Funds were not necessary, and so he was going to save 17 lakhs of rupees. There is not a word there about the dredger only doing a fifth or a quarter of its estimated quantity. It is absolutely silent on that. Then we come to the next year. In March 31, 1925, Report, the only reference to it of a general nature, I think, is that the " work made steady progress." Surely all the people in Bombay could see that it was not making steady progress, but that is all this Official Report says. With regard to the other dredger, which did 15,000 cubic yards dredging for the whole season's work when it ought to have done about 1,500 cubic yards an hour, all they say in this Report is that " progress was disappointing." It did practically two days' work in the whole season, and all they have got to say is that the progress is disappointing. Then, in the last one of 1926, after giving some details one observes there is no mention of the output at all, but it is practically passed over in silence. That being so, probably you will agree with me that the public in Bombay were justified in feeling anxious about the state of affairs?

A.—Those reports are certainly not very illuminating.

Q.—Could they be less so? I do not suppose you think so?

A.—Well, perhaps not.

Q.—It is in connection with that I want to ask you this question. What did the Government do to take the public into their confidence besides issuing these Annual Reports? Did they do anything?

A.—They gave the Advisory Committee full access to the information. They set up the Advisory Committee, which was appointed in August, 1924, as soon as the first results were known to be unsatisfactory—as soon as the first year's results of the dredging were known, no time was lost then in giving all the members of the Legislative Council access to all information. It was hoped that would be sufficient communication to the public.

Q.—But actually the Government did nothing? It waited until August before it even did what had been done?

A.—That is the valid criticism that you make.

Q.—I was very much interested in the remarks you made to the Chairman in the last part of your evidence, and I was going to ask you a question on the same subject. As ex-Acting-Governor of Bombay, and ex-Financial Adviser, I wanted to ask you your general opinion as to the advisability of completing the whole scheme. Various suggestions have been made in Bombay. One was that we should leave an ornametal lake in the middle of it, and another that we should leave it as it is, and other suggestions were that it ought to be finished in its entirety. You suggest that the present slump in values in Bombay should be looked at from a more distant point than the year 1926?

A.—Yes.

Q.—And that we should take account of the general prosperity and future necessities. You should look at the future necessities of Bombay from a far more distant point than the year 1926?

A.—Certainly.

Q.—Do you think that the scheme will ultimately be required for the expansion of Bombay?

A.—Yes.

Q.—You do?

A.—Yes.

Q.—Do you think it would be a good thing if the Government were to complete the scheme although it involved some heavy financial burden?

A.—Yes, I think, in the long run, it will certainly be remunerative. Four or five millions sterling is nothing to the city of Bombay—absolutely nothing.

Q.—It is a very fine city. I had never seen it before, but I was vastly impressed by it. Anyone could see that it would be an enormous asset to the city of Bombay if this scheme were completed, but I do think you have been very extravagant in your projected lay-out. I think the present cost of the scheme will induce you to think a little more soberly in the lay-out of the scheme if you ultimately come to do it. I notice you have got there a 120-foot road. We have no such thing in the whole of this country. Land in Bombay is surely too valuable to give it up to a 120-foot road?

A.—We have got a 120-foot road in the heart and centre of Bombay, and that is thoroughly congested with vehicular traffic.

Q.—I was there in the slack season, so I did not see it?

A.—The population of Bombay is somewhat in the neighbourhood of a million and it is congregated in a very small area. In the ordinary streets of Bombay it is difficult to get a carriage through when the people are out in the evening. The width of roads required is larger, I suggest, than you are likely to want here.

Q.—There is the road right along the front. They have got Queen's Road?

A.—That is a 50-foot road, and it is crowded very much indeed.

Q.—Now they can go round Worli. They have some very wide roads out there?

A.—Yes; that is rather in advance of necessity, I quite agree.

Q.—If you have nothing more to say on that general subject I should like to have your view as to the desirability of completing the scheme?

A.—I should like to speak about that at some length, and if I may do so I should like to speak after lunch on the subject.

Sir Frederick Hopkinson.—Very well.

(Adjourned for a short time.)

Sir Frederick Hopkinson.—When we stopped for lunch you were going to give us your views generally as to the desirability or otherwise of proceeding with the Back Bay Reclamation Scheme, having regard to the possible or probable future requirements of the city of Bombay, not taking the view of to-morrow or the day after to-morrow, but of the distant future. If you would give us your opinion on that we shall be glad.

A.—Well, the Committee are well acquainted with the general formation of the city, and the way in which the whole island runs down to an extremely narrow point.

Q.—Yes?

A.—The communications coming down through the centre of the island with its narrow point are very bad indeed. In fact, there is no through communication at all from the north of the island down to the extreme point. They have been working for 30 years on getting a through communication, and the road is not completed yet. When that is completed it will not be anything like sufficient for the traffic which is coming. The result of that must be, in my opinion, that the business classes will have to live nearer the extreme point where their office quarters exist.

Q.—In fact, it is the only point, is not it, within a reasonable distance of Bombay that is open to the business people, Malabar Hill being pretty well occupied?

A.—Yes, and there being no possibility of any lateral expansion. The sea shuts it off on the one side. The harbour with very difficult communication in the monsoon season shuts it off on the other. Then there is another consideration which may have been put before you, and that deals with the military offices at the far end.

Q.—That is all settled?

A.—Block No. 8 is settled. It is practically reclaimed. The military offices which are scattered all over the town will be grouped together in one quarter in Block No. 8.

Q.—In or near Block No. 8?

A.—In or near Block No. 8. That is a very important consideration which one need not specify in any detail, but in order to secure that great advantage it is well worth the while of the State as a whole to pay a sum of money. In times of trouble (we must always understand that there will be some times of trouble in Bombay City) those classes which are now raising some agitation against the scheme will be the first to take

refuge on this area which has now been reclaimed. That is taking a long view—not the year 1926.

Q.—I think you might say a little more about the desirability of doing it from the business man's point of view and having so much more land there for lateral expansion both of the city and residences, because you get a seafront with the new reclamation of four miles in length, which is a very valuable asset to the city of Bombay, in my opinion?

A.—Yes.

Q.—Do you agree with that?

A.—Absolutely, it is most valuable.

Q.—There is no other place in the vicinity of Bombay that conceivably will be so valuable as the site of the Back Bay reclamation. Do you agree with that?

A.—That is absolutely correct. You have the south-west monsoon breeze blowing straight over that area. That is the most favourable situation in all Bombay for health.

Q.—From the health point of view?

A.—From the health point of view.

Q.—Also, speaking from the lateral expansion of the business quarter of Bombay, is not it equally important?

A.—I think it is, but land in the business quarter a few years ago was selling at a thousand rupees a yard. An offer was made and refused at 1,200 rupees a square yard for nearly 100 square yards.

Q.—That is £80 to £90 a square yard?

A.—Yes.

Sir M. Visvesvaraya.—What was the extent of the area involved in that offer?

A.—That particular offer referred to only one particular site.

Sir Frederick Hopkinson.—You will not get anyone to offer that for 1,145 acres straight off.

A.—No, it was only one particular site. It is merely an illustration. I do not suggest for a moment that is an average price.

Sir M. Visvesvaraya.—That has been actually paid for land on which the Tata buildings are now constructed. They paid 1,150 rupees a square yard.

A.—Yes, and I think that is an area of 500 square yards.

Sir M. Visvesvaraya.—It is more than that.

Sir Frederick Hopkinson.—Would not this reclamation in your view add enormously to the general value of Bombay as a city?

A.—Yes, enormously. I consider it essential to the continuance of commercial life in Bombay.

Q.—That is a very serious statement to make, but I presume you make it after due consideration?

A.—I consider that the cost of trading in Bombay is far too high, not merely because of the charges of the Port Trust and the difficulty of transport inside of Bombay, but there is the cost of residences and office accommodation in Bombay. That is all based on the price of land.

Q.—One witness told me that the price of a flat in Bombay is higher than the price of a similar flat in the West End of London?

A.—I think that is a correct statement. Then we have to consider that the people in London who pay these high prices base these prices on the trade of the Empire—hundreds of thousands or millions of pounds. The people of Bombay have to pay these very same high prices on a very much smaller margin of trade. They cannot afford to do so unless they have land produced at a very much cheaper cost.

Q.—Then, again, part of this reclamation site would make an excellent site for open spaces?

A.—Yes.

Q.—For recreation grounds and for public gardens and so on?

A.—Some of it is allotted for that in the lay-out. Whether we can afford to go on on such a lavish scale for those purposes just now we do not know.

Q.—I believe some people do think your provision is somewhat lavish in that respect. I think the Committee will agree with me in saying we are inclined to think you are giving up land in Block 2 for that purpose which is the most valuable part of the new reclamation scheme, but if you pushed the recreation grounds further to the south where the land is not so valuable it would be desirable?

A.—I think that is a point certainly to be settled now on your advice. I quite agree with you. I think we have to reconsider it and not be quite so liberal in the selection of land to be set apart for open spaces.

Q.—Is there any other point you would like to make in connection with the value of this land at Bombay?

A.—Do you mean in regard to how to pay for it?

Q.—No, I am on value. Is there any additional inducement which you can hold out to the Government for prosecuting this scheme to its final completion?

A.—I should like to remind the Committee of the large fluctuations in prosperity that Bombay has gone through in the last 50 years.

Q.—That is the point I had in my mind. At the present time they are in the trough?

A.—In the trough.

Q.—As we are in this country?

A.—Quite so.

Q.—We do not anticipate always to remain in the trough.

A.—Bombay went through a similar period 60 years ago after the American War. Then subsequent to that period it has had various waves of ups and downs culminating in an enormous wave of prosperity during the war. Some 25 years ago now, the fortune of one of the biggest families in Bombay was very largely increased by their far-sighted land speculation. Mr. Jamsetji Tata bought land in Hornby Road at 25 rupees a square yard and he was laughed at for being a fool at the time. That land subsequently has gone to 500 or 600 rupees a square yard in 25 years.

Q.—That is a 24 times increase?

A.—A 24 times increase in 25 years. Mr. Billimoria can confirm that, I think.

Mr. Billimoria.—It is quite a correct statement.

A.—The wealth of Bombay is very difficult to compute.

Sir Frederick Hopkinson.—I suggested that some wealthy men in Bombay should combine and present this to Bombay, but I escaped from Bombay with my life.

Mr Billimoria.—We have not many multi-millionaires in Bombay. We wish we had.

A.—If you want to have some figures—you can check them, of course, and I can only speak from memory—the assessable value for Income Tax purposes of Bombay City is between 30 and 40 crores of rupees. That is the assessable value of the incomes of people above the minimum rate.

Sir Frederick Hopkinson.—If this scheme is finished and built upon that will go up?

A.—Immensely, but what I want to suggest is this. Of that 30 crores a very large portion will be available for investment in land and buildings. The first thing that an Indian wants is a good house and, if possible, a good piece of land. I think the desire for that is even more widespread in India than it is in England. As soon as the cotton mills begin to pay once more, a great portion of their wealth will be invested straight away in land reclaimed from the sea here. I do not think there is anything excessive in the estimates that were made of the rate at which this land would be taken up. Those estimates are in various printed papers at your disposal.

Q.—At the present moment Bombay public opinion is extremely pessimistic, as you might expect it to be in a time of great depression in trade. It was to the same extent optimistic in 1919 and 1920—unduly optimistic, I gather. It may be that it is now unduly pessimistic.

A.—Some of the most loud-voiced exponents of that pessimism are very largely interested in preventing this land coming into competition with their own holdings.

Sir M. Visvesvaraya.—With their own properties?

A.—Yes.

Sir Frederick Hopkinson : Therefore, it is for the Government to hold a wise balance between those two views?

A.—I do not know whether a sentence in that Report which you showed to me just now by Mr. Manu Subedar attracted your attention, in which he suggests that it will be a most disastrous thing for Bombay if this land is brought into competition with properties now held in Bombay.

Q.—It is a different kind of land. This, I should imagine, from my small knowledge of it, to be infinitely more desirable than any other land that I have seen in Bombay city?

A.—Yes, but still it will be snapped up, and to that extent people will not take inferior land now available. To that extent these property holders will suffer.

Q.—Therefore, that will make them all the more anxious to depreciate the Back Bay reclamation land?

A.—Precisely.

Sir M. Visvesvaraya.—You seriously think rents will come down?

A.—They must. That is one of the objects of the whole scheme. But it is for the benefit of the people at large. There is no virtue in high rents except for a few successful monopolists.

Sir Frederick Hopkinson: And the recipients of the rent.

Sir M. Visvesvaraya.—The only point we have to weigh is what price shall we get for this land, and to what extent should it be extended now?

Sir Frederick Hopkinson: I think it would be a very bold man who would venture to put any sort of price on it now, or in the near future.

Sir M. Visvesvaraya.—The point is, after what time would it come in?

Sir Frederick Hopkinson: If the Government get this land they will have to exercise great discretion in the disposition of it?

A.—Certainly. Perhaps I might just say one word more. You have laid some emphasis on the insufficiency or the alleged insufficiency of the information given by the Government.

Q.—When I speak of the Government I speak of the governing body and the people they govern. That is to say, my remarks should be applied to the people who ought to have given you this information. I use the word Government because, after all, it is the Government which is responsible?

A.—Yes. I have seen some complaints that sufficient opportunity was not offered to the members of the Legislative Council. I would like to explain that point. Under the law a certain limited period is allowed for the debating of the Budget—12 days in all. The Governor can appoint so many days at his discretion up to a maximum of 12 days. He has in every case given a maximum of 12 days for the discussion of the Budget. Then it rests with the members of the Legislative Council to use their discretion so as to concentrate their time on those matters which are of the greatest importance. In 1921 we had our first Budget Session in the first Council under the Reform Scheme. They were all raw, and they were very keen, so every petty question that came up in order was debated at inordinate length. So that ultimately the closure had to be applied and the Development Department had five minutes out of 12 days. That was not within the discretion of the Government. They could not stop the eloquence of those speakers. They said over and over again, " Let us leave that and get along. We have a big matter waiting for you." Nobody paid any attention to that, but they went on discussing, and five minutes was the total amount left for this. The second year we laid considerable emphasis on this over and over again, and asked them to get on to the Development Scheme. In my opening speech I told them this was waiting for discussion and I hoped they would give time for it. After a lot of persuasion we eventually managed to get two hours in the second year. Then in subsequent years we altered the order of the debate. The last year I had authority to settle the order in which the subjects should be taken up. I took up the Development Scheme first this year. The year before this I had it put half way through. In the first three years we hoped they would exercise their discretion, but there was a certain stereotyped order of subjects in which development came low down and we could not get them to come to it.

Q.—Eloquence is a fatal gift, is not it?

A.—So that my suggestion is that it was not the action of the Government that prevented a full discussion of the development problem. It was at the discretion of all the gentlemen concerned in the Legislative Council. We asked them over and over again also to come round and see things for themselves. We offered to conduct them round the scheme. We had arrangements made, and a train to come for anybody, and we found, out of 112 members, very rarely we would get eight or 10 to come and look at things.

Q.—Eight per cent?

A.—Yes. I submit, for this Committee to consider it, that we did our level best to make these things thoroughly well known and understood, and it is not our fault that there was not wider publicity to everything that we knew from the very first. We certainly concealed nothing so far as the Government is concerned.

Q.—I remember showing a party round some works, and I gave them champagne and sandwiches. I remember one man holding up a glass of champagne in one hand, and a sandwich in the other, and he said, " Mr. Hopkinson, this is a most interesting sight? "

A.—Well, we were not allowed to give champagne and sandwiches. The Government audit is much too severe.

Mr. Billimoria: With regard to the remarks which have just fallen from your lips, I trust that you have gone through the evidence that was recorded in Bombay. I do not know whether you have gone through the whole of it or not, but it is on record

that some of the members of the Council complained very bitterly that the Government deliberately withheld information and did not give them any opportunity to discuss at the Budget time questions arising out of development: that in former years not more than five minutes were allotted; in the second year about 15 minutes; and in the last year only two hours were allotted, when the Government knew very well that they were in a hopeless muddle and that they had to go before the public and tell the public candidly that the scheme was going to be a failure, and that even then they allotted only two hours. This is the impression that has been in the mind of the public of Bombay. I shall be glad if you would kindly explain whether that is the real situation, and whether it was that the members of the Council wasted more time on unimportant matters and left over this important matter from consideration?

A.—There is no question of the Government allotting five minutes in two years, or anything else. It was not within the power of the Government to make any allotment at all. The one allotment that was laid down was 12 days for every item of the Budget.

Q.—Could you not have extended it by another day, on a subject so important, and vitally concerning the interests of the city of Bombay?

A.—It was impossible according to the law. The Statute law gives a maximum of 12 days.

Sir Frederick Hopkinson.—Does this come under the ordinary Budget? Is not it a loan fund?

A.—It is a loan fund.

Q.—Does it come under the ordinary Budget?

A.—It does.

Mr. Billimoria.—Did the members themselves appreciate it was their own fault, and not the fault of the Government, so that if they now complain, that complaint is not justified? Is that what you want to suggest?

A.—I certainly suggest it is totally unjustified. I think they know perfectly well that it was the action, not of each individual, but of the general body of councillors.

Q.—Taking it that there were other important questions to be discussed, and the discussion lasted for the whole of 12 days and there was no time left when this item was reached on the Budget, how were the members to have their grievances ventilated, or to bring to the notice of the Government that there are certain difficulties which they want prominently to be brought to its notice? What is the opportunity for members of the Council to do that?

A.—If the subject has been shut out from the Budget, then it is open to the members interested to bring a resolution up in the session of the Council to discuss any particular specific recommendation that they desire to make to the Government.

Q.—Under the rules they cannot do it, because once a subject has been discussed, no resolution is permitted?

A.—That does not apply to the Budget discussion.

Q.—So that the members who have complained about it are labouring under some misapprehension that the Government deliberately withheld information, or did not give them an opportunity to discuss a vital issue?

A.—That is certainly an entirely unjustified charge. Whether they are labouring under that misapprehension or not, I cannot say. I would ask the Committee, if they can find the opportunity, to have a look at the Budget debates.

Sir M. Visvesvaraya.—We have the records?

A.—You have only seen the last year's, but there are five or six years' debates open to your consideration.

Q.—We have all the records?

A.—You will see there has been frequent reference to matters of the Development Department and replies given by the Government.

Mr. Billimoria.—With which the members were not satisfied?

A.—With which individual members were not satisfied, but with which the majority of members were satisfied, by the vote they gave approving the grant.

Q.—I am talking of those gentlemen who have come before us and have given evidence complaining very bitterly that the action of the Government was to be condemned in that direction, and we want something on the record to clear up that from you?

A.—Their real complaint is against their colleagues, the other members of the Legislative Council, who refused to support them in their grievance against the Government. Mr. Laljee Naranji made several proposals in the Legislative Council to omit certain grants. He could not get the other members of the Legislative Council to support him in his attack against the Government and the Department.

Q.—In the course of your evidence just now, in answer to my friend, you referred to some 60 years ago. That means history repeats himself. Sixty years ago the people of Bombay had burnt their fingers after the war. There was a trade depression, and people had been ruined to a very large extent. Is that the reference you are making to the 60 years ago history?

A.—The reference is to the recovery from that period.

Q.—You are aware that about the time that this scheme was launched, there were one or two syndicates very anxious to do this reclamation work?

A.—Yes.

Q.—You are aware of that fact?

A.—Yes.

Q.—If that syndicate had been entrusted with this work, do not you think they would have been in the Bankruptcy Court by this time, having regard to the results we have seen? The manner in which the work has been conducted shows that it has not been possible to carry out this reclamation scheme within the estimate of 367 lakhs?

A.—No; I do not think they would have been in the Bankruptcy Court. These particular syndicates have far greater financial powers and resources than three or four crores. These same syndicates have financed other works in India running into 20 to 30 crores.

Q.—True, but I mean if a scheme or project which, on paper, appears very profitable at 367 lakhs, may not be so productive or remunerative when the figure reaches 11 crores, and if the resources of the syndicate were limited to that capital amount, they would now be in the Bankruptcy Court, I suggest?

A.—It is very difficult to get to the bottom of the purse of these gentlemen to whom you refer.

Sir Frederick Hopkinson.—You have tried your best as Chancellor of the Exchequer?

A.—No. I have seen what they can do in other concerns which have been hard hit. They have overcome great difficulties with the most wonderful resourcefulness.

Mr. Billimoria.—You were playing with public funds in a matter like this. Do not you think that the Government ought to have been very careful before launching such a scheme to see that the estimates were properly checked?

A.—Quite true.

Q.—And that they were satisfied that this was going to be a productive piece of work?

A.—Quite true.

Q.—Did you at the time when the scheme was arranged consider that reclamation had a reasonable prospect of being a productive scheme?

A.—I have explained more than once that I was not in India or associated with the Government at headquarters at that time.

Q.—In reply to Sir Frederick you have stated you desired the whole of the reclamation to be completed. You know that the area is 1,145 acres for the whole scheme?

A.—Yes.

Q.—It makes available 22 lakhs of square yards as land for building sites?

A.—22 out of 55 lakhs—very good.

Q.—Do you think there is an immediate demand for such a huge area as that having regard to the depressed state of the conditions of trade in Bombay and the financial disabilities of the people of Bombay?

A.—22 lakhs will not be taken up in the next few years.

Q.—A few years may mean 50 years?

A.—I hesitate to prophesy what will happen in Bombay in 50 years, but I have very great hopes that the recuperative power of the city is enormous.

Q.—But there is no immediate possibility of the whole of this area being taken up, having regard to the present circumstances. You are very intimate with the conditions of life in the city of Bombay, and you will say there is hardly any possibility of 22 lakhs of square yards being taken up in the next few years?

A.—No. I hesitate to give a time limit, but it will be all taken up if it is made available in time.

Q.—Can you give any indication of that time?

A.—No.

Q.—It is very difficult to prophesy?

A.—I cannot give you the time but I would like your Committee to notice one fact. There has been a complaint from these interested sections of the population amongst other pessimistic prophecies that no land is being taken up now and no buildings are being constructed. That is definitely stated in the report of Mr. Manu Subedar, to which you have made reference. If you turn to the actual statistics available in the report of the Improvements Trust of the amount of building space that is built on year

by year in the last five or ten years you will find that last year when these people were complaining that no building was going on the amount of building was in fact twice as much as before the war. That is the last report of the City Improvement Trust. There is the total given year by year of the amount of building space built over, and it has been going up even in the last few years in spite of all this depression.

Q.—You may not be aware that several people who have taken up land from the Improvement Trust had to give it up again and the Improvement Trust had to cancel some of the contracts, which I can prove from the records of the Improvement Trust itself?

A.—I know that, but only in a very few cases.

Q.—It is over a large proportion of land. There is an official report for the last year which gives rather an alarming figure?

A.—Very well, but you can examine the report and compare it with the other statements to which I referred you.

Q.—When these estimates of 367 lakhs were practically doubled and came to a figure of 702 lakhs, did it not cause anxiety to the Government of Bombay?

A.—The figures were examined and we still thought that the scheme would prove remunerative.

Q.—At a figure of 702 lakhs?

A.—Yes.

Q.—How was the figure of 367 lakhs accepted? Was it merely the recommendation of Sir George Buchanan and his estimate, or was it tested and examined by any independent engineer or by any Government Department?

A.—That is before I came there. I do not know.

Q.—Do you know that the Port Trust were not consulted, although the Port Trust had very great experience of dredging in the harbour? Do you know that nobody ever attempted to consult those authorities for the purpose of getting any advice from them? Can the Government give any reason why the Port Trust was not consulted?

A.—I have seen that statement made, but I doubt whether it is accurate.

Q.—Mr. Neilson, Chairman of the Port Trust, told us that the Port Trust were not consulted.

A.—Yes. I doubt whether it is accurate. I think the head of the Port Trust was almost certainly consulted. Whether the Port Trust as a body was consulted, which is what Mr. Neilson would have meant, I do not know, and Mr. Neilson was not in Bombay at the time.

Q.—Was Mr. Hatch the head or was he there?

A.—I do not know. I was not there myself.

Sir M. Visvesvaraya.—I am afraid that information may not be correct. They were not consulted when inquiries were made in Bombay.

Mr. Billimoria.—What has gone in on the record is that the Port Trust were never consulted?

A.—That is, no official letter may have been written to the Port Trust to ask them their opinion, but that the Governor of Bombay failed to consult the head of the Port Trust is, I think, very doubtful. I have already read to you Lord Sydenham's statement. I do not know whether I did read that part of it.

Q.—You did not refer to anything regarding the Port Trust?

A.—That is quite right. It is the subsequent sentence which did not apply to what I was saying at the time, but his letter goes on to say: "I got a Citizens' Committee to estimate the value of the reclaimed area, and I do not think there was any public body that was not consulted." That would be in 1912.

Sir M. Visvesvaraya.—That is ancient history?

A.—But it would refer to this.

Q.—We are on the 367 lakhs now.

A.—That is not Mr. Billimoria's point. Mr. Billimoria's point is as to the bottom of the harbour.

Mr. Billimoria.—I am on to the point as to the Port Trust being consulted.

Sir M. Visvesvaraya.—I thought he said in 1919.

Mr. Billimoria.—It is in 1919 that I am speaking of. In 1919, when this scheme was launched, I want to know whether the Port Trust were at all consulted.

A.—May I ask whether you are referring to the bottom of the harbour or to something else?

Q.—To anything connected with dredging, because they have a very vast experience of dredging. I want to know whether the Port Trust Authority were in any way, directly or indirectly, consulted, privately or officially.

A.—Well, I cannot give you any denite information because I was not there, but I wish to ask you to investigate this point—whether when enquiries were made in 1912 regarding the bottom of the harbour by Mr. Kidd the Port Trust were not consulted at that time on that subject as to whether the stuff was available there for reclamation.

Q.—If the Port Trust were consulted, can you assign any reason why when this scheme was launched the Port Trust came and interfered and would not allow the Development Department to dredge from the harbour? They said that it would prejudice their property to a very considerable extent and they would not allow any dredging being done in the harbour, and so did the Naval Authorities. Can you assign any reason if they were consulted why they should not have raised that objection then and why did they raise the objection later on? A very large area has been taken off which has in some measure interfered with the actual reclamation under consideration.

A.—Well, I have not seen the terms in which the Port Trust made their objection. My understanding was that it was the Naval Authorities that made the objection and not the Port Trust.

Q.—It is both. We have that on the record.

A.—The Port Trust supporting the Naval Authorities.

Q.—Each one saying that it would be dangerous for the harbour if any dredging was allowed from a certain area.

A.—That may be the opinion of the officers in 1926. When was the opinion given? Was it given in 1924?

Q.—Just about the time the dredging operations started—about 1923.

A.—These officers change and you get a new set of officers who hold different opinions to the first set. That is the explanation which I suggest for your examination.

Q.—In the course of your statement this morning you said that the Financial Adviser to the Government in India was available in Bombay, and it was his duty to have drawn the attention of the Government to the fact that the estimates had increased from 367 to 702 lakhs. Do you suggest that if he did not draw the attention of the Government of India to it that he failed in the discharge of his duty?

A.—I do not suppose for a moment that he failed to draw attention to it.

Q.—Were the Government of India aware of this fact?

A.—I do not know that they were, but I assume that they were.

Q.—You are doubtless aware of the fact that the Government of India were very reluctant to embark on such an ambitious scheme of reclamation involving 1,145 acres of land, and they were brought round when Sir George Buchanan completed the estimate and report and took it over to some department of Government; but in all the previous correspondence between the Government of Bombay and the Government of India it has been brought out that the Government of India was very chary of sanctioning any such ambitious project?

A.—Yes.

Q.—Do you know the circumstances under which the Government of India eventually were made to agree to sanction such a project? I suppose the natural conclusion is that they were persuaded on the figure of 367 lakhs, but if they had known the figure was going to be 702 lakhs they would have set their faces against it?

A.—It is difficult for me to express an opinion as to what the Government of India would do with certain figures before them, but I do not suppose that the 367 lakh figure was the determining factor.

Q.—What else could it be, because if you will kindly refer to the correspondence between the Secretary of State and the Government, all along it has been suggested how these borrowings had to be made, and so on; so unless there was a determined figure that question would not arise. It was to come out of loan operations, and the figure for the loan had to be determined; so that unless you know the capital cost, the question of the loan would not arise. The Government of India must have known the figure, and it was only on that basis that it approved and sanctioned the scheme. There could be no other factor for consideration.

A.—I should differ on that point. There was the other very important factor. There was the distress of the people of Bombay. There was a danger to the trade of Bombay as well. Those two important factors are so overwhelming that the figure of 367 or 702 lakhs sinks into insignificance in comparison.

Q.—So that you think there was an immediate danger, or an imminent danger as far as Bombay was concerned, that required the scheme?

A.—That is my opinion now from my subsequent knowledge of it. I also am of opinion that that was the view of the Secretary of State before the figure of 367 lakhs was ever arrived at.

Q.—Where was the necessity of secrecy? Why was the scheme launched with such great secrecy, and why was there this hush-up policy throughout? That has been

a very serious complaint from practically every witness who has been before this Committee—that the scheme was launched in complete secrecy. Was there any reason for it to your knowledge, if you know anything about it?

A.—I was not in India nor associated with the Government at that time.

Q. As a member of the Government, did you find that Sir Lawless Hepper was placing all the facts before the Government regarding his department?

A.—Those quotations read out by Sir Frederick Hopkinson cannot be said to be all the facts.

Q.—Was he placing all the facts before the Government?

A.—I say those quotations which Sir Frederick Hopkinson read out do not constitute all the facts.

Q.—That does not give an answer to my question, whether Sir Lawless Hepper placed all the materials and all the facts before the Government. I want to know were their eyes opened, or were the Government kept in the dark?

A.—I am afraid on that question you would get enlightenment from the head of department, Mr. Cowasjee, because Sir Lawless Hepper reported direct to Mr. Cowasjee. He did not report direct to me.

Q.—Do you think that the Government of Bombay took all prudent and reasonable steps to assure themselves that the reclamation scheme as proposed by Sir George Buchanan was a practicable scheme from the engineering point of view, as well as being financially sound? Can you express any opinion on that?

A.—Sir George Buchanan's scheme was based on Mr. Kidd's scheme, which, I have told you, on the authority of Lord Sydenham, was examined by the engineers of Bombay of that day.

Q.—Do you know there was sitting in Bombay a Committee called the Bombay Development Committee in 1914?

A.—Yes.

Q.—They had before them the report of Mr. Kidd at the time, and a firm of engineers were employed by Messrs. Tata, the firm being Messrs. Jacobs and Davis, supposed to be a very respectable and responsible firm of engineers, who had called this scheme a mad scheme. Are you aware of these papers, or do you know anything about it?

A.—Which scheme have they called a mad scheme?

Q.—This scheme concerning the 1,145 acres of land. Perhaps you would just refresh your memory about it?

A.—May I see it? (*Document handed to the Witness.*)

Q.—There are various passages which I have marked setting out the opinion of Messrs. Jacobs and Davis?

A.—This is March, 1913.

Q.—Yes. The Committee was sitting in 1913, and between this and the new scheme Sir George Buchanan has not done anything new. He has simply followed blindly the report and figures of Mr. Kidd. There was no independent investigation by Sir George Buchanan at all?

A.—This report maintains that they believed that the pressure on the available area of Bombay did not warrant any such scheme of reclamation.

Q.—That was in 1913?

A.—That was in 1913. But the pressure on the available area of Bombay came into force after 1913. The report of 1913 is a report before the war.

Q.—That is right?

A.—No report condemning the scheme before the war can be applicable to the conditions after the war.

Q.—You would not, as a business man, be surprised to find that the conditions before the war were normal and that after the war everything had gone up considerably? Prices had practically doubled. In some cases they were four times as much. In spite of that Sir George Buchanan goes and gives you an estimate on a figure approaching that of Mr. Kidd's estimate. Would not the Government then have thought it prudent to get that estimate checked by some other independent firm of engineers to see whether Sir George Buchanan was not labouring under some misapprehension in merely taking the figures of 1913, which no business man could ever have thought of as applying in 1919 when things were booming, when prices had gone up four times as much, when labour had gone up, when materials had gone up, and when there was a tremendous rise all over?

A.—Yes. Perhaps you will ask Sir George Buchanan on the point.

Q.—Messrs. Jacobs and Davis, in their report to Mr. Tata, say: "Mr. Tata, I believe, will live to congratulate himself on having been persuaded from not going into this thing, if the project ever comes off." Well, his prophecy has come to be absolutely

correct. This was made as far back as 1913, and the circumstances in 1919 were entirely different. Any man having had a look at that report would have thought twice before launching such an ambitious scheme. Did you, as finance member of the Government, get any opportunity to know anything about it?

A.—About that report?

Q.—Yes.

A.—I have heard of that report, but I submit that it is quite inapplicable to the later conditions, and in spite of that report Messrs, Tata and Sons wished to take up this work. They were the principal applicants for this contract themselves, rejecting entirely this report to which you now draw attention.

Q.—That was one of the reasons which induced the Government to go in for the scheme. Is that right?

A.—The fact is that Messrs. Tata thought well of it, and other Bombay financiers thought well of it, and in fact the whole of Bombay financial opinion would have condemned the Government very seriously in 1919 if they had not taken this scheme up.

Q.—Was there any question of policy at that time which also induced the Government of Bombay to embark on the scheme?

A.—A policy for the benefit of the trade of Bombay and the benefit of the people of Bombay, who were living in very congested areas and slums which have aroused criticism from every quarter.

Q.—If the conditions remained the same as they were in 1919, you would have hardly found a critic to-day?

A.—Certainly.

Q.—But because there has been a slump later on, things have considerably changed, and it is now that you find that the scheme has been condemned as hopelessly foolish?

A.—Yes, that condemnation coming chiefly from the people who are now holders of land in Bombay.

Q.—There has been a very serious complaint that the Government of India and the Secretary of State were not consulted when the estimates were doubled. Under the Reform Scheme, what is the constitutional law. Is the Government of Bombay bound to consult the Government of India or the Secretary of State? Were they in any way bound to do so, or could they have acted absolutely independently of the Secretary of State and the Government of India?

A.—They are bound to report to the Government of India their Budget, their revenue and their expenditure, and the Government of India, if they see anything which they disapprove of, can exercise authority over the Government of Bombay for a reconsideration of the matter. But there is no necessity for the Government of Bombay, now that provincial autonomy has progressed, to ask sanction. That is the difference from the original position of 1919.

Q.—Does that mean that, under the Reforms, H.E. The Governor has got all the powers?

A.—Subject to the vote of the Legislative Council.

Q.—That means you bring the scheme, or the revised estimate, before the Council and get it sanctioned, and therefore it was a constitutional manner in which the Governor of Bombay acted?

A.—That is in accordance with the new scheme of provincial autonomy under the Reform Act of 1921.

Q.—So that if any party has any grievance against the Bombay Government in that direction I suppose it is because of want of knowledge of the circumstances—it is because of want of knowledge that the Government of Bombay are criticised in not having approached the Government of India or the Secretary of State for sanction? Is that correct?

A.—That may be the explanation.

Q.—Does the Government of India Act make that perfectly clear? Are any specific powers given to H.E. The Governor to act independently of his other advisers in matters of policy or otherwise? Has he wider powers than he had before the Reforms came in?

A.—No, certainly not.

Q.—Then if there is no alteration in the constitution, would not it be natural that the higher Government would be consulted?

A.—The alteration is that the check has been transferred from the Secretary of State and the Government of India to the Legislative Council. The control rests with the Legislative Council in their power to accept or reject the Budget.

Q.—So that nothing could be done without a vote of the Council?

A.—That is so.

Q.—In your speech before you left India, when you were entertained to a farewell dinner, you stated that no city was built on accountants' figures, such as Rome, and other places. You made some mention of that. May I read it out to you to refresh your memory?

A.—Certainly.

Q.—" Whether we survey Delhi in ancient days or the Phœnix that has now arisen from its ashes; whether we look at Rome, Athens or Paris, has anybody ever suggested that they were founded on a dividend-paying basis? The capitals of even the petty States of South America have had millions of pounds expended on them to provide the necessary appurtenances of a democratic State. It is certainly a disappointment that the State should not reap from Back Bay the enormous profits which were at one time anticipated." Those are your words as quoted in the " Times of India." How do you reconcile that statement with the statement which has been referred to coming from Sir Chimanlal Setalvad as to the tremendously huge profits of 30 crores. Apparently, when the scheme was launched, everybody looked forward to a handsome profit. When we come to the years 1925 and 1926 we are faced with a very sad outlook, and this question has been brought out that the reclamation scheme was not taken up as a dividend-paying proposition. Have you anything to suggest with regard to that?

A.—I do not quite understand what you want me to answer.

Q.—When the scheme was originally launched it was expected it was going to be a very profitable scheme?

A.—That is so, but not 30 crores. I have nothing to do with the 30 crores figure.

Q.—We will take it at 30 lakhs?

A.—The correct figure I suggest was 3 crores.

Q.—If it was 3 crores profit, then now we find there is a 3 crores loss?

A.—Very well.

Q.—Without even the completion of the scheme. If the whole scheme is to be completed one does not know what the result will be, but the Government has to make provision for an estimate of a 3 crores loss, and they have done so from last year's Budget?

A.—Yes.

Q.—How would you reconcile that statement with the statement that no city has been built on an accountant's basis—as a dividend-paying proposition? When the scheme was launched hopes were held out that it was going to be a very profitable scheme?

A.—Yes.

Q.—When the scheme has been working for three years, we find we are being faced with a very heavy loss?

A.—Yes.

Q.—How are those two statements to be reconciled? Is there any explanation for it. Is there anything which can throw light which will remove the grave doubts that the people of Bombay have about it?

A.—I fail to understand what there is to reconcile. The statement made in that speech to which reference is made is that other cities were built on a courageous scale without being based on an accountancy system.

Q.—That is quite right?

A.—On the other hand, we started with this belief, that if the cost returns were calculated on strict accountancy principles, even then it would pay, but now supposing we find it does not, then we shall be in no worse condition than the other great capitals of the world.

Q.—That is what I wanted to know so that the answer may go on the record clearly?

A.—Yes.

Q.—Then it has been suggested by prominent business men of Bombay that, though amenities for the city are desirable, the people of Bombay can only have such amenities as they are prepared to pay for, and for many years to come there will be little public money to spare for anything but necessities. Having regard to that statement, the question is, is it prudent to go on with the scheme at this stage?

A.—I am suggesting that it is a necessity for the commercial life of Bombay.

Q.—You will be sinking a very large sum of capital into it without getting any return for a number of years to come, so that instead of it being productive it will be a non-productive capital asset?

A.—For the time being, but the State can bear the burden and recoup by its returns in the course of years.

Q.—Do you think with the present condition of finance of Bombay it could bear such a burden?

A.—Yes.

Q.—Under the present finance circumstances?

A.—Yes.

Q.—You think without any further taxation the city of Bombay could bear this further burden?

A.—You are adding one straw after another. Your last words now are "without any further taxation."

Q.—That is what the people would like?

A.—Quite so.

Q.—Naturally, when they feel that they are already overburdened with taxation they do not want to pay any more. The difficulty comes in with regard to the taxation?

A.—It is a country which has not got the element of Death Duties. There is plenty of scope for further taxation yet.

Q.—That is a view that the majority do not agree with in India?

A.—I beg your pardon, the majority are strongly in favour of Death Duties. It is the few rich men who are at the top who disagree with that.

Q.—It is those very few who are always somehow very prominently listened to by the Government. It is not the masses who are heard, unfortunately?

A.—I hope they will be heard. There is money to bear this burden.

Q.—Not without further taxation?

A.—If the liabilities are heavier than has been estimated, there is sufficient financial reserve in the City and the Presidency of Bombay to meet that burden and carry it until this land becomes remunerative. That is my opinion.

Q.—Have there been any data or figures prepared or anything which will convince and satisfy the public of Bombay that there are resources at the back of the Government of Bombay for a large number of years from now to bear this heavy burden?

A.—If you investigate the Taxation Enquiry Committee's report issued only a year ago you will find there the advice on the subject of Death Duties, which is a very large potential source of revenue in Bombay.

Q.—Do you attribute the cause of the failure of this scheme entirely to the dredging and to no other reason? Is there any inefficiency in the Department which has been one of the causes of the failure of the scheme—I mean the failure in the sense that has been described now, that instead of it being a productive or profitable proposition it looks to be otherwise and is disappointing in that sense?

A.—I have heard from Sir Frederick Hopkinson some strong criticism of the engineering details on certain points which I had not heard before. I hesitate to express an opinion on those points. I should like to hear what the gentlemen incriminated would have to say before I gave an opinion on that point.

Q.—Your connection with India has been spread over more than 25 years. I do not know whether you have come across such colossal blunders in an engineering scheme as have been committed in the present scheme, no provision having been made for storm water drains in the original scheme, no provision having been made for the usual allowances of 10 per cent., whereas every engineer makes that provision, and so on. There are a number of defects of that kind. All that we will get out from the lips of Sir George Buchanan when he comes here. In view of that did the Government exercise prudence in merely depending upon Sir George Buchanan's estimate, or were they misled or were they let down? What is your personal feeling in the matter?

A.—Those events are before I joined the Government. I have never seen the estimates of Sir George Buchanan and I am not acquainted with this particular aspect of the case.

Q.—Was it not brought to your notice as the honourable Member for Finance concerning where the scheme was defective, and what serious omissions there were in the original estimate which led to the estimates being doubled?

A.—I heard that at a later stage, yes.

Q.—Having heard that, did not you think these looked very colossal blunders, from an engineer's point of view? No engineer of repute could have made such blunders on such important items as sewage?

A.—I have heard of equally large omissions in other schemes in other parts of the world.

Q.—To such an extent as that?

A.—To an equal extent.

Q.—In the course of a speech by His Excellency, in the March Session, to the Council?

A.—What year?

Q.—This year, 1926—says that the conditions are not likely to improve for some time, and in your speech as well you say you " will now confine my attention to the prosecution of the scheme as far as blocks 1, 2 and 8 are concerned." I hope you still adhere to that view and you do not want the completion of the whole scheme immediately, but as and when the resources of Bombay admit of it and permit of it, that the scheme may be carried through eventually. Is that your view?

A.—Since I made that speech in March I have seen the work progressing in block No. 8 in April and May, and I am of opinion that block No. 7 affords very favourable opportunities for the continuance of the work this next winter.

Q.—With regard to block No. 7, there are difficulties as far as development is concerned. The development is a very expensive item. If you take that into account with the interest charges, it does not look like a financially sound proposition to have that block completed. That is a matter of opinion, of course. I do not know whether you have had opportunities to study these figures. There was a Committee appointed by the Government of Bombay called the Kay Committee which has gone thoroughly into the question. They have found that it would not be profitable to undertake the reclamation of block 7 at the present stage?

A.—I have not seen their report, but I merely give you the opinion I formed when I was leaving Bombay early in June, that block No. 7 could be done easily and cheaply by means of the dredger, Sir George Lloyd, dredging from the harbour, and it would be a great pity either to leave that dredger idle this winter or to disband the crew, and that whatever action may be taken with regard to the dredger eventually, No. 7 can be filled up now with the existing pipes, with the crew well-trained and the dredger working efficiently. The subsequent disposal of the land, if that land can be reclaimed as cheaply as I believe it can now, can, I think, safely rest for a few years.

Q.—There is no doubt that block 7 can be filled in by dredging cheaper than by any other method, even in years to come?

A.—Yes.

Q.—But taking it as a whole, with the difficulty as to sewage and other difficulties which are existing in that particular area, the Committee felt a difficulty about it?

A.—What difficulties?

Q.—There is no sewage provision—there is no drain. All that will have to be provided for, which is a very expensive item. It is not the dredging alone. The dredging is a very minor item comparatively, and it is undoubtedly cheaper than dry filling?

A.—Yes.

Q.—But there are other difficulties which come in the way of the completion of block No. 7. If you have any view about it we shall certainly be glad if you will elaborate them, because we are called upon to express an opinion on that subject, and we should welcome your views and experience on it?

A.—I have not seen this report detailing these difficulties, but I am much impressed with the facility for carrying out No. 7 with the existing pipe, and before any question of scrapping the dredger Sir George Lloyd should be entertained.

Q.—I quite agree. We also appreciate that we have to give six months' notice to the superior staff in the event of our discontinuing the dredging operations. That might also be another factor which might induce the Government of Bombay to carry on with filling in by dredging in block No. 7. In your speech at the Council meeting in March, 1926, with regard to the report of the Advisory Committee you stated that the Committee have set forth a candid criticism of the scheme, and that the Government are of opinion that the recommendation of the Committee is sound?

A.—That was the recommendation to continue with 1 and 8 at that moment.

Q.—You are still of the same opinion? You have not altered that opinion since that date?

A.—At that moment we were discussing whether blocks 1 and 8 should be stopped or not.

You recommend that they should be——?

A.—That that work should go on, and that was the advice of that Committee. That is without prejudice to what could be done on the other parts.

Q.—Then a member of the Council has raised a question against you, in the course of which he says: " I want to convey to our finance member what is our idea of this policy of manufacturing land more than the need for it, which has landed us in the position in which we are to-day." That is Mr. Naranji's remark. Have you anything to suggest with regard to that, because I do not find any answer in the subsequent pages in response to that remark?

A.—What is the point he raised?

Q.—Whether by manufacturing more land in this way there would be any demand for it?

A.—I have stated I consider there will be a demand for the whole of this land in the course of time.

Q.—In course of time, but not immediately?

A.—Yes.

Q.—Then at page 129 you say that you have gone into the conditions of Bombay, which are very interesting. You give some figures, which you gave us this morning, with regard to land being sold at 1,200 rupees per square yard. But that is a small compact area in the business area in close proximity to the banking and business houses?

A.—Yes.

Q.—You cannot expect to get that value for the reclaimed area?

A.—Certainly not.

Q.—Most of that reclaimed area will be utilised for building sites. People cannot afford to pay such ridiculously high figures for building sites. Have you any idea that any part of the reclaimed area could be set apart for business or commercial houses? Surely this area will all be used for residential purposes, and not as commercial sites?

A.—We have seen London moving westwards from the City, and the same movement will take place here gradually and in time.

Q.—It has been pointed out to us that the Ballard estate scheme has not been a total success, and there are large areas still vacant. Business people would not care to go out of a small compact area because they would like to have themselves centred round the banks and commercial firms?

A.—Yes.

Q.—In view of that, is it likely that they would go as far as Kolaba and far-distant places for business purposes?

A.—Have you verified that statement about the Ballard estate?

Q.—Yes; we found most of the buildings are still vacant?

A.—Still vacant?

Q.—Yes?

A.—That is an unfortunate result of the present depression of trade.

Q.—Undoubtedly so; but until conditions materially improve you would not recommend the completion of the scheme as a whole, but would go slowly with the object of ultimate completion as and when the circumstances demand or finance permits?

A.—Yes; I think I may accept that.

Q.—In your speech you have stated such work cannot be carried to completion in a generation?

A.—Such work as what?

Q.—Such as reclamation work. That is at page 132?

A.—No; not the reclamation, but the "renovation of the city of Bombay." That is a wider thing than this reclamation scheme. It is the rebuilding as a whole of the city of Bombay.

Q.—I am very much obliged to you for the able manner in which you have cleared up some points about which some people in Bombay have great doubts. Some of your answers have particularly cleared away those points, and I am thankful to you for that.

A.—Thank you.

Sir M. Visvesvaraya: Thank you very much for your evidence?

A.—Is that all you want to ask?

Q.—Yes.

A.—Then there are one or two points I have in my memory which I should like to mention. Some reference was made at one time by a witness before you to some letter which is alleged to have been written by the late Mr. Mead to some contractors. Was that letter ever produced before you?

Mr. Ewbank: Yes, it is a letter from Mr. Mead to Colonel Grisewood.

A.—Of what date?

Mr. Ewbank: It is the 19th March, 1920. (*Letter produced and handed to the Witness.*)

A.—The suggestion was as I read it, was that this was some private or personal action by the late Mr. Mead, and I wish to make it perfectly clear that it was a letter under instructions.

Sir M. Visvesvaraya: I am glad to have this made clear.

Mr. Billimoria: Do you mean under the instructions of the Government of Bombay?

A.—Yes. It is March, 1920. It is there as a letter definitely from the Government. There is nothing whatever *sub rosa* about it. There is nothing whatever improper. The suggestion as put to you was that there had been some impropriety. I wish it to be perfectly certain that it was a purely official communication by Mr. Mead as secretary writing on behalf of the Government.

Q.—The suggestion has been that the whole of the Council was not consulted, but that is the usual practice, I take it. I take it, one member does not necessarily consult another member unless it is a question of policy, or a very broad question on which opinion has to be consulted?

A.—Yes; if it touches the branches with which some other member is concerned, then he would be consulted; but if it is entirely confined to one department, then it would be within the discretion of the member of the Council concerned, or he would take it to the Governor, or if it affected a financial point he would refer it to the finance member. It would not go to the other members in the ordinary course.

Q.—So that the insinuation that the honourable member kept back information from his colleagues is absolutely unfounded? There is no foundation for that at all?

A.—None whatever to my knowledge

Q.—Dealing on strict constitutional methods, it is left to the member in charge to carry on his departmental work without reference to other members of the Council?

A.—Yes.

Sir M. Visvesvaraya: We thank you for your evidence. (*The Witness withdrew.*)

(*Adjourned to Tuesday, 21st September at* 11 *o'clock*).

SUPPLEMENTARY WRITTEN STATEMENT PUT IN BY SIR HENRY LAWRENCE.

I will take in turn various suggestions which I understand have been placed before the Committee.

(1)

" This scheme was hastily conceived and pushed through in 1919-20."

The idea of reclamation in Back Bay dates from 1860.

In the past 25 years one Governor after another has taken it up, and pressed it on his successor to carry through. Lords Lamington, Sydenham, Willingdon, were prevented by various obstacles from achieving success. Mr. Edwin Montagu as Secretary of State decided in 1918 that the condition of Bombay required urgent improvement, and that the financial situation was favourable to success. It was therefore at his special instance, and with the approval of Lord Chelmsford, then Viceroy, that the Government of Bombay opened up negotiations once more with the Government of India in early '19. Mr. Billimoria asked whether the estimate of Buchanan with a figure of 367 lakhs was the decisive factor in obtaining sanction from a reluctant Government of India. That factor was of comparatively minor importance. The main factor was the determination of the Secretary of State to relieve the distress of the poorest classes in Bombay with which he had been vividly impressed in his recent visit to Bombay.

(2)

It is true that the scheme was turned down in earlier days on the score of Finance, but the war had altered the aspect from which all financial problems had been regarded, and the growth of wealth in India during the war had been very great, and funds were available both for private enterprise, and public loans on an unprecedented scale. For an enterprise supported on grounds of humanity by the Secretary of State for India, and the Viceroy for India, it was no longer possible to argue that Indian Finances could not bear the risk of some millions sterling, and whether those millions should be 3 or 5 or 10 was a minor factor.

I was asked whether the Government of Bombay could bear the strain of an anticipated loss of several millions, and I replied " Yes," because they have the resource, as yet untapped, of death duties. I was not asked whether they ought, unaided, to bear the loss if it should occur. The Committee perhaps do not consider that they are concerned with the possible financial expedients. I will not therefore go into the details of this aspect of the problem. It has, however, been suggested that the City of Bombay is alone concerned with the benefit of this scheme, and this view in my opinion is incorrect. The miseries of life in Bombay fall most severely on the immigrant population recruited from the interior, and they will share the benefit. The burden should therefore be also borne in part by the whole Presidency. Moreover, last spring the Legislative Council accepted a financial bill imposing fresh taxation chiefly on the City of Bombay which will shortly produce an annual revenue of 20 (twenty) lakhs of rupees, a sum sufficient to discharge the interest and sinking fund of a sum of

3 (three) crores, should that loss occur. The death duties when imposed will be chiefly paid by the City of Bombay and will be able to meet a far greater liability if necessary. Private enterprise in Bombay has succeeded in financing within recent years many large schemes, notably the iron and steel works of Messrs. Tata, the hydro-electric works of Messrs. Tata, and many new cotton mills. They have borne the burden of a capital expenditure of some 50 (fifty) crores, and have passed through periods of severe depression. There is no ground in my opinion to believe that the Government of this Presidency cannot finance a scheme which is estimated on the least favourable forecast to require about 11 (eleven) crores. The Government can afford better than private companies to wait until the period of depression is past. Moreover, if any further difficulties should occur the Government of Bombay, who were urged to take this matter up by the Government of India and the Secretary of State, have a claim to assistance from the Government of India which that Government would not, in my opinion, reject or resist.

The Government of Bombay have been charged with indifference or neglect in the administration of this scheme; and Sir Frederick Hopkinson laid some emphasis on the delay in ascertaining the results of the work of the dredger in 1924. It may help the Committee if I explain the machinery which was set up. The Director of the Development, Sir Lawless Hepper, is a Colonel of the Royal Engineers who earned a high reputation as the head of one of the largest Railway Administrations in India, the G.I.P. Railway. During the war he added to this reputation by his work in the Munitions Department, and received the honour of knighthood. For administrative purposes there was a Secretary to Government, a selected member of the Indian Civil Service. For Financial advice there was a high officer of the Financial Department of the Government of India. On the Engineering side the Director had the assistance of Sir George Buchanan whose reputation is well known; and under Sir George Buchanan a chief engineer of the Public Works Department (Mr. Lewis) who was specially recruited from Burma for his knowledge of marine engineering. Under Mr. Lewis there were several officials with specialist experience. By Indian standards of administration this was a strong and capable staff, and no complaints reached the Government from the head of this Department that further assistance was necessary. Under the normal constitution of Government one Member of Council held the Portfolio for Development, and to him the Director of Develpment made his reports. Sir Frederick Hopkinson enquired whether weekly reports of the output of the dredger should not have been submitted to the Government. This would not have been in accordance with the system of delegation of powers which is the normal system both in India and in England. I have heard persons otherwise well informed ask whether the Government of Bombay is the Government of Bombay City, and I therefore pointed out that the Government of Bombay dealt with the Presidency of Bombay, and not with the City alone. Important though the City of Bombay is, we have a population of nearly twenty millions outside the city, and the annual expenditure involved in this scheme represents only some ten per cent. of the total annual expenditure with which the Government of Bombay is concerned. The normal procedure of the delegation of powers was therefore adopted in this case. That the members of the Government failed to take any interest in the working of the dredger is I think an improbable assumption. I regret that I cannot speak more positively on the point for the following reason:—The dredger started operations on 8th December, 1923. I fell ill during that month, and was invalided to England, and did not return till August, 1924, but I know that Sir Leslie Wilson, who assumed the Governorship from 10th December, 1923, and my successor, Mr. Cadell, visited the works frequently, and made enquiries. Sir Frederick referring to the view put forward by the Engineering advisers to Government that it was impossible to ascertain the output of the dredger until the end of the dredging season in May, appeared to suggest that the lay members of Government should not have accepted this expert opinion. I think that the Committee will realise that the working of suction dredgers is a matter on which lay persons would have some difficulty in enforcing their views; and in this case the advice was given by the Engineer in charge of dredging with the support, as I understand unqualified, of the Chief Engineer, of Sir George Buchanan, and of Sir Lawless Hepper.

In considering whether the Government were indifferent or neglectful the Committee will, I hope, give due weight to this combination of expert advice.

(4)

I have explained above the administration machinery that was provided. I should add that when an important financial question arose it was referred by the Secretary of Development for the opinion of the Financial Secretary to Government, and ultimately for the opinion of the Financial Member of Council (myself). I have not observed in the newspaper reports of the proceedings of the Committee in Bombay that they have had before them either the Financial Adviser to the Development Department or the Financial Secretary to Government, or the present Finance Member. I was

asked by Sir Frederick Hopkinson whether in 1922 a *balance sheet* was drawn up in connection with the revised estimate of 702 (seven hundred and two) lakhs, and I replied that my impression was that a *forecast* had been prepared, a reply which clearly did not satisfy Sir Frederick. I should like to explain that in the normal procedure the financial results of the new estimate would have been noted upon by the financial adviser, by the Secretary to Government in the Development Department, by the Director of the Development Department, by the Financial Secretary to Government, by the Member in charge of the Development Department, and would ultimately have reached the Financial Member of Council, and the Governor. I have no doubt that these notes are in existence, and they are probably based upon a *forecast*, but I do not remember the precise form of presentation. In any case I attach no value to the ambiguous statement by Mr. Manu Subedar that " these matters do not appear to have received any consideration from Government "—a remark to which my attention was particularly drawn.

(5)

The Committee asked me no questions regarding any charges of corruption against the Staff, and I assume that they are satisfied on this point. I should like, however, to add that Mr. Cowasji Jehangir, the Member of Council, consulted me frequently on such charges, and that I was satisfied that the Director was exercising an alert and efficient supervision, and had taken steps to deal with all charges on which evidence was available, and that some of the charges which have been repeated before the Committee were wholly unsustainable. As regards corruption in the higher ranks of the Department in Bombay, I am convinced that there is no ground whatever for any suspicion of corruption.

H. S. LAWRENCE,
Oxford.

20th September, 1926.

The Committee Assembled at 11 a.m. on the 21st September, 1926, all the Members being present except the Chairman.

40th Witness, Mr. William Speirs, Dredging Master.

Sir M. Visvesvaraya.—What is your Christian name?
A.—William Speirs.

Q.—How long did you work with dredgers in Bombay?
A.—For four years.

Q.—Do you recollect from what date?
A.—Well, I could not recollect the date I signed on.

Q.—Or the month?
A.—I went out there in March.

Q.—Of 1922?
A.—Yes, 1922; but it was six months previous to that before I joined the Back Bay reclamation.

Q.—You are on leave, I take it?
A.—On leave at present.

Q.—From what date?
A.—From the 26th June.

Sir M. Visvesvaraya.—Sir Frederick Hopkinson will take your examination now.

Sir Frederick Hopkinson.—How old are you?
A.—62.

Q.—Have you had a wide and extensive experience of suction dredging?
A.—Suction dredging and bucket dredging and all classes of dredging for the last 35 years.

Q.—We will confine ourselves to suction dredging. What experience have you had of suction dredging?
A.—14 years.

Q.—Including that of Bombay?
A.—Including Bombay.

Q.—The time at Bombay is included in the 14 years?
A.—Yes.

Q.—What size of dredgers did you have before the Bombay ones? What is the biggest?

A.—28.

Q.—Where was that?

A.—Sydney.

Q.—In what material were you dredging?

A.—Sand.

Q.—What other dredgers?

A.—Bristol.

Q.—What size was that?

A.—24, 28-inch pipe.

Q.—What material was it at Bristol?

A.—Mud.

Q.—What others?

A.—Well, I was part of the time in South America at Porta Lisa and at Sewri.

Q.—What size of dredger was that?

A.—24-inch.

Q.—What material?

A.—Sand.

Q.—Were those pumping for reclamation purposes, or into hoppers?

A.—Sewri was reclamation.

Q.—And Sydney?

A.—Sydney, into hoppers.

Q.—And Bristol?

A.—Into hoppers.

Q.—Any others besides those three dredgers which you have been speaking of?

A.—The Sewri reclamation, are you speaking of?

Q.—Were you at Sewri?

A.—Yes. That is 39-inch.

Q.—How long were you on that?

A.—4½ years.

Q.—Was that mud, or mud and clay?

A.—Mud and clay.

Q.—Can you give me any idea as to the relative proportions of the two materials, mud and clay?

A.—We had about 25 per cent. of mud and the rest clay.

Q.—That is 75 per cent. clay?

A.—To begin with, of course, we had not that material, but ultimately we were reaching it.

Q.—But taking it broadly over the whole work, you had that percentage?

A.—Yes; we had about that.

Q.—So that you seemed picked out to take charge of the dredger for the Back Bay reclamation?

A.—Well, no.

Q.—But having had that experience at Sewri?

A.—Probably.

Q.—Adjoining the same harbour?

A.—Yes.

Q.—Had you similar cutters? At the Sewri reclamation you were dredging with the "Kalu" and the "Jinga"?

A.—Yes.

Q.—Were they similar cutters to the "Sir George Lloyd"?

A.—Yes.

Q.—Their specified output was 1,500 cubic yards an hour, was it not?

A.—Yes.

Q.—Did they ever do that?

A.—Yes.

Q.—Consistently and regularly?

A.—No.

Q.—Taking them approximately, did they do that approximately throughout the whole work?

A.—No; they did about 85 per cent. of it.

Q.—They did about 85 per cent.?
A.—Yes.

Q.—Of 1,500 cube yards?
A.—That is the "Jinga."

Q.—Not the "Kalu"?
A.—Not including the "Kalu."

Q.—Why is that?
A.—Well, different material to deal with

Q.—Was the "Jinga" working in clay or mud?
A.—The "Jinga" was in both clay and mud.

Q.—The "Kalu"?
A.—The "Kalu" had about 90 per cent. of mud.

Q.—What was her output?
A.—Well, her output ran down to about 1,000 or 1,100.

Q.—To 1,000 to 1,100 cube yards an hour, that is?
A.—Yes.

Q.—That is only about 60 to 70 per cent. efficiency?
A.—Yes.

Q.—What was the cause of that, do you think?
A.—The soft silt.

Q.—The material?
A.—There was so little material.

Q.—The material was so soft?
A.—Yes.

Q.—Was it so soft that you could not get a proper percentage of material through the pipes?
A.—Yes.

Q.—It was so light?
A.—It was so light.

Q.—How did that compare with the mud at Bristol?
A.—Something similar.

Q.—What percentage did you get at Bristol?
A.—Well, we ran in the hopper as high as 30 per cent.

Q.—That is 30 per cent. solid?
A.—30 per cent. solid.

Q.—But if the material was so light you would lose a large proportion of that overboard?
A.—No; there was none of that put overboard—in this case, no.

Q.—It could not have been very light?
A.—No.

Q.—You would not describe that as very light material?
A.—No; I would not describe it as very light. It was light, but the percentage that we pumped was so solid that it was as much as it was possible for the machine to do.

Q.—Did you have a cutter on that dredger?
A.—No; just a trailer.

Q.—Did you ever try any pumping with the trailer only in the light mud?
A.—No.

Q.—You stuck to the cutter?
A.—We stuck to the cutter.

Q.—What percentage of the light mud did the "Kalu" do at Sewri.
A.—Probably about 15 per cent.

Q.—That is high, is not it?
A.—At times, and at other times it would rush down to perhaps 5 per cent.

Q.—How did you test that?
A.—The only way you could test it was the distance that you travelled—the amount of ground that you travelled over.

Q.—You tested by the soundings?
A.—By the soundings.

Q.—You did not attempt to make any tests from tubes taken from the output?
A.—No; none whatever.

Q.—Why not?

A.—It was too soft a ground. The pipes were laid in the ground and you could not get near them while they were buried.

Q.—You actually did not take any tests with tubes?

A.—No; one reason was the first cut off of the dredger is the best of that material.

Q.—The first cut?

A.—Yes.

Q.—Does it keep soft?

A.—When you get to 40 per cent. the next cut is less and less.

Q.—Why is that?

A.—Because the ground gets harder as you come to the bottom. You have to get the hard with the soft.

Q.—In what way does it get harder? It is the same mud. I am speaking of before you get to the clay.

A.—There was probably no clay in the " Kalu."

Q.—You just told me that the " Kalu " got 90 per cent. of mud?

A.—Yes.

Q.—I am speaking of the Sewri reclamation?

A.—And I am speaking of the Sewri reclamation. Ten per cent. was hard. It was rock bottom.

Q.—But 90 per cent. was mud?

A.—Yes.

Q.—When you are dredging with mud, as I understood you, the percentage of mud varied from 15 per cent. down to 5 per cent.?

A.—Yes.

Q.—When we were speaking of percentages let us make it quite clear what it is we mean. The point in my mind is that proportion of solid matter in the water. Is that what is in your mind also?

A.—Yes.

Q.—So that really to get it you would have to take your soundings, take different quantities, estimate the time you had been working, and the amount of water you have pumped, and then divide the solid matter dredged into that, to get that percentage?

A.—To get that percentage.

Q.—Was that done?

Q.—Yes.

Q.—Did you have an engineer on board?

A.—No; we did it ourselves.

Q.—You did that yourselves?

A.—Yes it was only for our own information.

Q.—When the " Sir George Lloyd " was ordered were you in Bombay?

A.—No; I was in Renfrew.

Q.—Were you in any way consulted by Sir George Buchanan about the dredging?

A.—None whatever.

Q.—Did he know that you had been employed for four and a-half years on the Sewri reclamation?

A.—That I could not say.

Q.—Did Simons ask you your experience of the Sewri reclamation?

A.—Many times.

Q.—That was before they made the contract for the " Sir George Lloyd," I presume?

A.—Yes.

Q.—You really went to Simons and gave them the benefit of your experience of dredging in Bombay?

A.—Yes.

Q.—I presume that would influence them, at any rate to some extent, in the design of the new dredger?

A.—Yes.

Q.—Did you describe to them the nature of the clay?

A.—In Sewri?

Q.—Yes.

A.—Yes.

Q.—How would you describe that clay?
A.—Well, as an ordinary blue clay.

Q.—Hard or soft?
A.—Medium.

Q.—Could you call it soft clay?
A.—Well, I would not call it soft clay.

Q.—Would you call it tough?
A.—No.

Q.—Not even tough?
A.—No; not even tough.

Q.—Would you call it hard clay?
A.—No; just a medium consistency between hard and soft.

Q.—Neither hard nor soft. Do you know the meaning of the word " unctuous," because Mr. Kidd, in making his borings, there described the clay as " stiff and unctuous." " Unctuous " is a word that can be used in many senses. I have never heard it used in describing clay before, but it seems to me to be a very sound definition of the clay I saw there. It means that it is stiff, not soft, but a sticky and tenacious clay.

A.—Yes.

Q.—Toughish.
A.—Yes.

Q.—Would you call that a fairly good descripion of it?
A.—Well, not as regards Sewri.

Q.—Was Sewri any different from the harbour where you dredged into Back Bay?
A.—Yes.

Q.—It was a different clay?
A.—Yes; the colour of the clay was very much the same.

Q.—In what way did it alter? Did any of the lower strata of the clay appear of that consistency I was just speaking of?
A.—Yes.

Q.—Which?
A.—The lower strata when you came to it previous to the moorum.
Q.—Was that hard or soft?

A.—It was then a hard consistency that would not cut. It was stiff and pulled the machine from you.

Q.—Do you think that was clay at all? When the cutter would not work, do you think it was clay at all? Do not you think you were on the moorum?
A.—No; it was of a clayish nature.

Q.—How thick was it?
A.—Probably about 3 or 4 feet, in some cases.

Q.—In describing this material to Simons, as I presume you did before they designed the " Sir George Lloyd," did you tell them it was medium hard or medium soft clay?
A.—Just a medium soft clay.

Q.—I have seen some samples there, but soft is not quite the right word to use in connection with it. It is distinctly stiff. I had some samples picked out for me when I was there, and it is quite stiff.
A.—After drying?

Q.—No; still in the water.
A.—Yes.

Q.—Tough, tenacious clay, and you have got to cut every bit of it?
A.—Yes; you have to cut every bit of it.

Q.—In the Sewri reclamation did you pump into a watertight lagoon?
A.—Yes.

Q.—Was it totally enclosed?
A.—Totally enclosed. There were 14 acres square.

Q.—How do you account for the loss of something like 33 per cent. of the material which was pumped into the Sewri reclamation?
A.—We pumped up until we had a level of 22, and then after that——

Q.—That is 22 level?
A.—Yes; there these pipes laid through the bank, and all the water was drawn off which came above there—water and light mud.

Q.—Do you think that accounted for the loss?
A.—Yes; there was great loss in it.

Q.—Through the pipes?
A.—Through the pipes.

Q.—So that it was a loss that could have been remedied?
A.—Well, I do not know.

Q.—Suppose you made a long weir and raised it higher and gave the mud longer time to settle?
A.—I do not think it would have dried.

Q.—No, not dried; but given it longer time to settle?
A.—Well, I believe it would have taken months before it would have settled; it was so light.

Q.—At any rate, that explains the loss?
A.—Yes.

Q.—You had a similar loss at Back Bay, did you not?
A.—Much similar.

Q.—In that case did it go through the rubble mound?
A.—Yes; I understand so.

Q.—Did you see it?
A.—No.

Q.—Why not?
A.—It is not part of my duty.

Q.—Surely!
A.—Certainly I have seen it. I have been over and had a look at it.

Q.—That is what I meant.
A.—Yes.

Q.—You have actually seen the mud go through the rubble mound?
A.—Yes.

Q.—It was proposed at one time by the Director of Development that this reclamation mound should be sealed to prevent the loss of that material. Did you hear anything about that?
A.—Yes; after the first season.

Q.—I understand Sir George Buchanan was opposed to that view?
A.—Well, I could not say about that.

Q.—You do not know?
A.—No.

Q.—At any rate, it was not done the first season?
A.—Not the first season.

Q.—Nor the second season?
A.—Partly.

Q.—Partly in the second season?
A.—Yes.

Q.—But was it entirely done in the third season?
A.—Well, no; it was not entirely finished in the third season.

Q.—Are you sure?
A.—Yes.

Q.—I think you will find it was.
A.—There were some parts which were not done.

Q.—I think you will find it was entirely finished in the third season. Was not the effect of this that you dredged a great deal more material from the harbour than was retained in the reclamation?
A.—Yes; according to the figures.

Q.—A large percentage?
A.—Yes.

Q.—Still more the second year than the first year?
A.—Yes.

Q.—And the third year the engineer's figures, I believe, show more was retained in the reclamation than was actually dredged?
A.—Well, that I could not say.

Q.—That sounds impossible, does not it? Do you think it is probably due to inaccuracy in one of the previous years?
A.—It may have been.

Q.—Owing to the difficulty of getting an exact level, owing to the soft nature of the material?

A.—Yes, that may have been so.

Q.—At any rate, if the wall had not been sealed, you would have continued to lose a large percentage of the mud that they were pumping?

A.—Yes.

Q.—That dredger, the " Sir George Lloyd," was designed to dredge 2,000 cubic yards an hour. Can you tell us in a few words the reason for that not being accomplished?

A.—The material is not suitable. The machine cannot deal with it.

Q.—Which are you speaking of—mud or clay?

A.—Clay—the lower strata.

Q.—Let us take the two separately, and begin with mud?

A.—We made a start with 2,000 yards an hour.

Q.—How do you know that?

A.—By the speed we travelled, and the quantity we have taken up.

Q.—By the speed of your cut?

A.—Yes.

Q.—What is the length of your cut?

A.—5 feet 6 ahead.

Q.—And 300 feet wide?

A.—Yes; and 10 feet deep.

Q.—10 feet deep in the mud?

A.—Yes, the depth of the cutter.

Q.—You ought to have got everything that was possible with a depth cut of 10 feet.

A.—Yes, the first cut was 10 feet.

Q.—At what speed did you travel across the cut?

A.—35 feet.

Q.—Per what?

A.—Per minute.

Q.—35 feet per minute?

A.—Yes, I think that would be the average.

Q.—One could easily average it?

A.—It would probably be more.

Q.—It is 5 feet 6 by 35 feet by 10 feet 6 deep?

A.—10 feet 6.

Q.—Let us see what that means. That is about 74 cube yards a minute. That is 4,440 cube yards an hour; but we have not done 1,000 cube yards an hour. However, I will have that calculation checked. On that calculation we have never done 25 per cent. of it?

A.—No, I am well aware of that.

Q.—What is the reason?

A.—The next cut. The next cut is probably 50 per cent. stiffer—the material to cut.

Q.—What you have given me is the first cut?

A.—Yes.

Q.—Is that clay or mud—you say clay?

A.—Clay.

Q.—But this clay did not maintain an equal depth of 10 feet 6 inches?

A.—No, it was very, very uneven.

Q.—But the surface of the clay was uneven?

A.—Yes, and the ground was very, very uneven.

Q.—Did you always get 10 feet 6 inches of mud?

A.—More or less.

Q.—Do you think that that practically coincided with the top of the clay?

A.—With the top of the clay.

Q. Because in some of these areas you will notice there is no clay at all in some of these patches where you have been working?

A.—That is as far as we could get at it by the working of the machine.

Q.—In block K there is no clay at all?

A.—No.

Q.—There is only mud?

A.—In this area here (pointing to the dredging area in the harbour as shown in the plan) in block K we had very little clay, but we have a sort of hard moorum.

Q.—You did not dredge the moorum?

A.—We had to go as far as the rock.

Q.—But you did not dredge the moorum?

A.—Yes.

Q.—You did?

A.—Yes.

Q.—What is the depth?

Q.—I should say from 10 feet as high as 18 feet *here*.

Q.—The moorum?

A.—Yes, on this part.

Q.—Here again on block H you have 4,200,000 yards of mud, and only 300,000 yards of clay, so that that is practically all mud, and the same with block G—there is no clay—at all?

A.—Well, of course there is nothing *here* at all. (The Witness pointed on block G.)

Q.—There is no clay there at all. Practically in the whole of these three blocks there is no hard material of any kind?

A.—We have it hard *here* (Pointing to block J). It does not matter whether we go round here—we have the hard bottom.

Q.—East of the Oyster Rock?

A.—Yes.

Q.—In that little block *there*, there is nearly as much clay as mud. For one of mud there is three-quarters of clay?

A.—Yes, three-quarters of clay.

Q.—That does not apply in these three blocks *here*?

A.—No. This *here* is mostly of a rough, sandy nature (The Witness pointed in block K), but mud on the top.

Q.—If it is of a sandy nature, it is good material for pumping?

A.—Yes, but little of it.

Q.—You told me the dredger in the top cut was working at the rate of 4,400 cube yards an hour?

A.—Yes.

Q.—Which is twice as much as what she was designed to do?

A.—Twice of her capacity.

Q.—My difficulty is this. The whole of the dredging work of the first and second seasons was down at the far end, was not it?

A.—Yes.

Q.—That is nearly practically all mud. Then why do we get such a poor output?

A.—Well, the output in the first season was due to one dredger, and having too long a pipe.

Q.—That was only for short time, was it not, whilst the " Colaba " was laid up?

A.—It was practically the whole of the first season.

Q.—The first season the first dredger only did 5,000 feet. You were dredging close in shore, and you had more than 5,000 feet delivery?

A.—Yes, we had more at times.

Q.—I think you will find that is right, that the first season you were dredging close in shore and the " Colaba " was not required to work?

A.—No.

Q.—Because the deposit was within the limit of 5,000 feet the capacity of the " George Lloyd," and I think only for a short time whilst the " Colaba " was being strengthened did you ever work up to 7,000 feet from distance of delivery?

A.—6,000 sometimes.

Q.—We have a statement showing all this. We will get that. Whilst that is coming, you said your second cut was 50 per cent. stiffer material?

A.—Yes.

Q.—Does that mean that it was clay?

A.—Partly clay and partly moorum.

Q.—But you had plenty of power in your cutter. We have been told out in Bombay that the cutter has 400 horse-power, and it is throttled down to work at about 160 horse-power, so that there should be no difficulty in cutting it?

A.—There is great difficulty in cutting it.

Q.—Not the clay, surely?
A.—Not the clay.

Q.—When she is working in clay, why is the output so much less that what she was designed to do?
A.—It is too hard.

Q.—But you say there is no difficulty in cutting it?
A.—No, there is no difficulty in cutting it; but we have got to take time to cut it.

Q.—The time is fixed by the design of the dredger. The cutter is designed to work 12 revolutions a minute, was not it?
A.—Between 11 and 12.

Q.—That is part of the design; and it would not make much difference whether it was hard or soft, so long as you had plenty of power. If the clay were soft, you could cut it with smaller power; if the clay were hard, you have got ample power to cut it with?
A.—Well, we may have ample power to cut it with, but there is only one way in which we can cut it.

Q.—What is that?
A.—That is coming back. Suppose we take the cutter and we are going to the right, well, we have found ground that she will not go into.

Q.—If the material is too hard, she will not go into it?
A.—It is too light, but we have not got the weight.

Q.—The cutter is not heavy enough?
A.—Yes.

Q.—It weighs 12 tons?
A.—Yes.

Q.—You mean the ladder is not stiff enough to force the cutter into the clay?
A.—No, we have not weight enough.

Q.—You have got 12 tons, plus the weight of the ladder and the power of the bow winch?
A.—Yes.

Q.—But she would not cut into it?
A.—No, the cutter will not sink into it.

Q.—That rather goes against your description of the clay, as being soft, does not it?
A.—Yes.

Q.—Then did you take your second cut on the way back?
A.—Yes.

Q.—You were cutting up against the face?
A.—Up against the face.

Q.—It looks to me as if that ought to be the easier way to do it?
A.—It is easier, but still we cannot cut enough of it to get the output.

Q.—You cannot cut enough of it?
A.—No.

Q.—Do you think you would have done more had your cutter been bigger and heavier?
A.—Yes.

Q.—You do?
A.—Not bigger, but heavier.

Q.—I do not think that that amounts to very much, because you have got all the power of your bow winch. It is the winch that does the heaving?
A.—Yes.

Q.—It keeps the cutter up to the face?
A.—Yes.

Q.—Not the weight of the cutter?
A.—The weight of the cutter must go into the ground before we get the material to cut. We must get the cutter into the ground before we can get the material to cut.

Q.—Its own weight would take it down?
A.—No, is own weight would not take it down.

Q.—The weight of it would cut its way down?
A.—No.

Q.—That is an extraordinary thing.
A.—It will cut its way down, but it will be a long time.

Q.—To make one cut down?
A.—Yes.

Q.—If it is a long time cutting down, it must equally be a long time making the side cut?
A.—Exactly.

Q.—Because the operation is precisely the same?
A.—The operation is precisely the same.

Q.—Are you short of power, or is it only the weight—you attribute it to the want of weight?
A.—And want of power.

Q.—But you have plenty of power. Your cutter engine is 400 horse-power, and we were told it was not working up to half of its power?
A.—That will not cut it.

Q.—It is not want of power in the engine-room, because you had that power?
A.—It will not cut it.

Q.—That rather disposes of what you said just now, that it was soft clay, because the softer the clay the easier it is to cut?
A.—The easier to cut.

Q.—That rather bears out the description that was given of the clay originally—that it was stiff, does not it?
A.—Yes.

Q.—We started off by making one cut right across at the rapid rate of 4,400 cube yards an hour. Now you drop your cutter into the stiff clay and you drop down to 50 per cent of that?
A.—50 per cent.

Q.—50 per cent. would still be over 2,000 yards an hour, which is more than the dredger was designed to do?
A.—Yes.

Q.—And that would have been very satisfactory to everybody in Bombay, yourselves included?
A.—Yes.

Q.—What was the total depth of the clay where you were working?
A.—Well, we vary from 15 feet to 35 feet.

Q.—Not near by?
A.—Well, we run in a hollow—probably in 1,500 feet, and we have 35 feet probably of 400 or 500 feet long, and then we began gradually to go up.

Q.—It would be gradual?
A.—Yes.

Q.—You would start away with 10 or 15, or perhaps 20 feet?
A.—We usually got about 18 feet.

Q.—And go up to 35 feet—is that your maximum?
A.—That was our maximum.

Q.—Did that take you 70 feet below low water level?
A.—High-water level.

Q.—Was the 70 feet below high-water level and not below low water?
A.—Below high water.

Q.—That is your second cut. Now coming to your third cut, what happened with that?
A.—It was still stiffer. We reduced down to about 800 at the finish of the cut.

Q.—You reduced to 800 cube yards an hour?
A.—Yes.

Q.—You had soundings daily?
A.—Daily.

Q.—Did you know how much had been done each day?
A.—No, we never knew anything that was being done each day.

Q.—You did not make calculations?
A.—No.

Q.—Although you could have done so?
A.—We could have done so.

Q.—There was no reason why a daily report should not have been sent to the office, showing exactly how much had been dredged?

A.—Yes, a report goes to the office. The Surveyor every day at 12 o'clock takes his soundings. He takes his soundings and he takes them to the office; but we never heard anything about them.

Q.—In the office they should know at 12 o'clock exactly how you had done in the previous 24 hours?

A.—Yes, in the previous 24 hours.

Q.—We were told here on Friday last that the Government did not get to know until August what had been done the previous December?

A.—Well, I could not say anything about that.

Q.—So far as you were concerned, the soundings were taken daily, and the work done could have been measured daily?

A.—Yes.

Q.—That is what I should have expected. You would not know what you were doing unless you had your soundings taken?

A.—Yes.

Q.—For your own satisfaction you would want to know exactly what you were doing?

A.—Yes.

Q.—I presume you were never satisfied out there with the rate of progress?

A.—We were never satisfied with the rate of progress. We were humbugged so much at times with the pipe line and other things.

Q.—What other things delayed you and reduced your output, because you had got down to 800 cube yards, which would still give you a pretty high average. That is your third cut. What thickness were those cuts in the clay?

A.—Well, the first would be 10 feet

Q.—10 feet?

A.—Yes; that is taking at 35 feet.

Q.—10 feet 6 inches I have got?

A.—That is taking it 35 feet for the face.

Q.—And what is your second cut?

A.—It would be about 9 feet reduced down to 4 feet.

Q.—The next one is 4 feet deep?

A.—Yes.

Q.—That still does not finish at 35 feet—that is 23?

A.—The last cut would be about 4 feet.

Q.—That is still stiffer?

A.—Yes; according to the further we go down we just have to vary the cut.

Q.—Did you actually see any moorum deposit on the reclamation site from your dredger?

A.—No.

Q.—Did you see the clay?

A.—We saw the clay.

Q.—You saw the mud?

A.—We saw the mud.

Q.—And you saw the lumps of clay?

A.—We saw the lumps of clay.

Q.—What is the biggest lump of clay you ever got out?

A.—Well, that I could not say.

Q.—What is the biggest you saw, roughly?

A.—Roughly, it would be about that size. (*Illustrating a length of about 2 feet.*)

Q.—As big as your head?

A.—No.

Q.—About *that* square?

A.—Square probably about 9 inches deep.

Q.—9 inches thick?

A.—Yes.

Q.—Do you mean the cutter would take a 9-inch piece in one cut?

A.—Yes.

Q.—If she could do that——

A.—If it is soft enough.

Q.—If it was soft enough?

A.—Yes.

Q.—That was clay. Your output ought to be well up to 2,000 yards an hour if she would take 9 inches?

A.—If we could get it continuously.

Q.—But you could not?

A.—We cannot do it.

Q.—Your next blade end on the cutter could not get anything at all?

A.—No. You see we also lost two.

Q.—How close were these cutters? I only saw the cutter for a few minutes.

A.—Probably about 2 feet 6 inches at the widest part.

Q.—I think they were rather closer than that—2 feet 4 inches.

A.—From tip to tip.

Q.—Does that agree with your recollection?

A.—Yes; that is taking the width you have only about 15 inches of space in between them.

Q.—My recollection is that there were about 15 inches between the blades.

A.—That is the width—between the back of the blade and the point of the other. Your blade is about 15 inches broad.

Q.—I should like to understand this. Taking the tips of the blades, how far is one tip from the next tip?

A.—About 2 feet 6 inches.

Q.—So that it is not like a shaving machine. You would get a fairly big cut.

A.—Yes.

Q.—That would account for your people getting sometimes 9 inches?

A.—Yes.

Q.—That would mean that the cutter had been jammed over starting the cut and had taken 9 inches cut from the top, would not it?

A.—Yes.

Q.—I want to see the key plan to see where these sections are taken. In the meantime, while that is coming, will you tell us: did you ever have anything to do with the borings?

A.—No.

Q.—Did you see them being made, or was it before your time?

A.—They were made about 1912 or 1913. It was during my time on the Sewri.

Q.—They were made during your time?

A.—Yes.

Q.—You saw them being made?

A.—No; but I knew they were being carried on.

Q.—You did know?

A.—Yes.

Q.—You would see their sounding boats in the harbour, I suppose?

A.—No; that is too far away.

Q.—You know nothing about the borings?

A.—Nothing whatever.

Q.—Did not the people who were making these borings come up and see what you were doing?

A.—No.

Q.—They were not interested?

A.—No.

Q.—Although you were working in similar material two or three miles away? Did you see Sir George Buchanan before the work was started in Bombay?

A.—No.

Q.—Did he know that you had been dredging the Sewri?

A.—Well, I could not say for that, but I presume he would know.

Q.—You presume he would know?

A.—Yes.

Q.—At any rate, he did not ask to see you?

A.—No.

Q.—We have still got, according to your account, a fair average output, going from 4,400 yards an hour down to 800 yards an hour from the third cut. Was it about the same for the fourth?

A.—Much about the same for the fourth cut.

Q.—Although the dredger has never given that output as measured in the reclamation, or as measured by the soundings?

A.—You see, the great output was only momentary. It was only for the first cut.

Q.—Still, that accounts for a pretty fair quantity; 10 feet 6 inches deep over the whole area?

A.—Yes.

Q.—Even the rest was 800 yards an hour, which is better than the records show of the mud and the clay together. Your recollection does not seem to agree with the actual figures as the work was ultimately surveyed. Of course, we know that a certain proportion of the mud has escaped through the rubble mound?

A.—Yes.

Q.—It was not much good your putting in 4,000 yards an hour if they were going to let half of it escape. Do you think the dredger will ever do anything better than what she has done in the past?

A.—Well, I believe we may do a little better as we begin to get properly settled down to our work. You see, we are practically new men. You have got men with no experience in dredging, and with no experience of this class of work whatever.

Q.—It should not take long to train a dredging master on one cut?

A.—Well, no; if you are able to settle down to it properly.

Q.—It is proposed if the dredger works next season to work 24 hours a day. Do you see any objection to that?

A.—I have no objection to what hours they work. They would have to take the hours we can give them as regards working. It means we have got to have another staff during midnight.

Q.—It can be arranged?

A. -It could be arranged, certainly.

Q.—When did you go out?

A.—In March, 1922.

Q.—That was about the time the dredger arrived?

A.—Just about it.

Q.—You practically arrived together?—Yes; I went out for the erection of the pipe lines—not as dredger master at all.

Mr. Billimoria.—Did I understand you to say that you did not work on any dredger at all?

A.—The dredger was not there then. But after the pipes were erected I was taken on as dredging master.

Q.—On what?

A.—On board the "Sir George Lloyd."

Sir Frederick Hopkinson.—You went out not as dredging master?

A.—Not as dredging master.

Q.—But solely to erect the floating pipes?

A.—I was employed by the Controller of Stores.

Q.—To erect the pipes?

A.—Yes.

Q.—Were all the pipes there when you got there?

A.—Partly there.

Q.—So that you were able to start on that job at once?

A.—No.

Q.—Why not?

A.—They were not erected. There was not enough of them. There were only six of them erected when I arrived.

Q.—You said "partly," and I thought you meant half, or something like that.

A.—No.

Q.—What did you do the first season?

A.—We did nothing but erect the pipes.

Q.—You say there were only six erected?

A.—Yes; there were six that were erected when I arrived there.

Q.—Six had been erected when you arrived?

A.—Yes.

Q.—Then you went on and erected the rest of the pipes on the pontoons?

A.—Yes.

Q.—How many did you do in the first season?
A.—The first season we did about 49 of them, I think.

Q.—Forty-nine?
A.—Yes; they were 70 feet to 80 feet long.

Q.—When were you appointed dredging master?
A.—I really could not tell you the exact month it was.

Q.—Tell me as nearly as you can.
A.—I think it was somewhere about December.

Q.—December, 1922?
A.—Yes.

Q.—The dredger and the " Colaba " by this time had arrived and had been dry-docked, I presume?
A.—No.

Q.—Not dry-docked?
A.—No.

Q.—We were told they had been dry-docked and their bottoms cleaned and painted.
A.—Yes; after I took charge.

Q.—At any rate, they were lying in Bombay?
A.—Yes.

Q.—The " Sir George Lloyd " really began work in December, 1923?
A.—Yes.

Q.—Can you tell us why it was lying there for 20 months before it did anything?
A.—That I could not explain to you.

Q.—You do not know?
A.—No.

Q.—Were your pipes right?
A.—Yes.

Q.—There was no reason, as far as the dredger and the pipes were concerned, why it should not have started working in December, 1922?
A.—Yes; you could have done it.

Q.—You do not know why it was not done?
A.—No.

Q.—Had you got a full crew for the work in December, 1922?
A.—No; we had no crew.

Q.—No crew at all?
A.—No crew; just the watchman.

Q.—Just the watchman?
A.—That was all.

Q.—Can you tell me when the crew came?
A.—The crew came about a fortnight or a month before we started work in November.

Q.—That would be in November, 1923?
A.—Yes.

Q.—Was it a full crew—a double crew?
A.—A single crew.

Q.—Enough for working eight hours a day?
A.—Eight hours a day.

Q.—Were you told why you were only to work eight hours a day?
A.—We were to work according to the Sewri work—the same number of hours that were worked at Sewri.

Q.—Did they only work eight hours a day at Sewri?
A.—We practically worked nine hours—sometimes nine and a half hours. We varied it.

Q.—They did not double the shift a day?
A.—No.

Q.—Did you ever, before you went to Bombay, know of a large and expensive dredger that only worked single shift for reclamation purposes?
A.—No.

Q.—Did not it strike you as being a waste of plant to have it lying idle for two-thirds of the 24 hours?
A.—It was, certainly.

Q.—The first year's output was very poor, I believe?
A.—Yes.

Q.—Did Sir George Buchanan come on board soon after you started in December, 1923?
A.—Yes; I believe so.

Q.—Did he ask you what progress you were making?
A.—Yes.

Q.—Was he satisfied with it?
A.—No.

Q.—He was not?
A.—No.

Q.—What did he do to increase the output?
A.—Well, we had no increase that season until we got a double crew.

Q.—He was dissatisfied with what you were doing in December, and January, 1924? Did he suggest you were not working the dredger properly?
A.—Not to my knowledge.

Q.—Not to you?
A.—Not to me personally.

Q.—You would be on the dredger the whole of the time?
A.—Yes.

Q.—Living in the dredger?
A.—At that time.

Q.—In general charge of it?
A.—Yes.

Q.—So that if he had any complaint to make he probably would have made it to you?
A.—Well, I do not think so.

Q.—You do not think so?
A.—No.

Q.—Why not?
A.—Mr. Brims would be the party to make it to.

Q.—Did Mr. Brims ever tell you that Sir George Buchanan was dissatisfied with the output of the dredger?
A.—Yes.

Q.—He did?
A.—Yes.

Q.—Was any suggestion made that you were not working it properly—that you did not know how to work it?
A.—Well not to me.

Q.—Was it made to anyone?
A.—I have heard it from outside.

Q.—Do not talk of outside—I mean from engineers?
A.—No.

Q.—Responsible people?
A.—No.

Q.—Did Sir George Buchanan ever make any suggestions to you?
A.—No.

Q.—Although naturally he would see you every time he came on board?
A.—Yes.

Q.—Did he make any in the second season?
A.—Well, no. Mr. Brims had all the suggestions.

Q.—He had the suggestions?
A.—Yes.

Q.—Did he have any suggestions from Sir George Buchanan?
A.—Well, I suppose so.

Q.—Because Mr. Brims in his evidence in Bombay said that Sir George never made any suggestion to him of any kind that the dredger was not working properly, or made any suggestion for its improved working. You were there to hear?
A.—Well, I understood from Mr. Brims it was through Sir George Buchanan that any suggestion came.

Q.—What suggestion came to you?
A.—The only suggestion was that the vessel was not making her output.

Q.—That is another thing. I am meaning suggestions for improving the output. You knew that the output was not being got, but what suggestions were made to you to improve the output of the dredger?
A.—Well as a matter of fact none whatever.

Q.—None at all?
A.—No.

Q.—Neither in the first season nor in the second season?
A.—No.

Q.—Nor in the third season?
A.—No. We were doing our utmost at all times.

Q.—Sir George Buchanan has, in a published letter to the Press, complained that the dredger was mishandled. Did he ever say so to you?
A.—No, not to me; and they had their opportunity.

Q.—You have had a wide experience of dredging, especially in pump suction dredging. Did you ever mishandle the dredger?
A.—No.

Q.—Did you always do your best?
A.—Always—as much as the vessel would do.

Q.—As much as the vessel would do?
A.—Yes.

Q.—You think you got out of the vessel all it was capable of doing?
A.—All it was capable of doing.

Q.—It is a very serious thing, in the case of a man of your reputation and experience, to suggest that you mishandled a dredger of that kind. Do you not think so?
A.—Yes, it is.

Q.—If he really thought that, do you not think he would have come on board and given you the rough side of his tongue?
A.—Yes; either that or sent me home.

Q.—If he seriously thought the dredger had been mishandled, would not it have been his obvious duty to send you home, and get somebody there who would not mishandle it?
A.—Certainly.

Sir Frederick Hopkinson.—One would certainly have thought so.

Mr. Billimoria.—You said you heard just now from an outside element that the dredgers were not working satisfactorily. What is the outside element?
A.—The public outside—the people spoke about it.

Mr. Billimoria.—What people spoke about it?

Sir Frederick Hopkinson.—What we call bazaar gossip.

Mr. Billimoria.—Is that what you mean?
A.—That is what I mean.

Q.—Was there any engineer who spoke about it?
A.—No.

Q.—Or from your own Department?
A.—No.

Q.—The Development Department?
A.—No.

Q.—It is only the bazaar gop?
A.—The bazaar gop, as the saying is.

Sir Frederick Hopkinson.—The only reason you did not work double shift in the first season was because in the first place you had not orders to do it, I presume, and in the second place you had not sufficient staff to do it?
A.—We had no staff.

Q.—In the second season they doubled your staff?
A.—Yes.

Q.—You had orders to work a double shift?
A.—We had orders then to work a double shift.

Q.—There was no reason, so far as the dredger was concerned, why it should not have worked a double shift in the first season?
A.—Well, everybody was strange to it, and it would have taken the best part of the season to have educated them to do it.

Q.—You would not keep a dredging plant costing a million for the purpose of educating a couple of dredging masters, would you?

A.—Well, you have to educate everybody aboard of her, from the winchmen downwards.

Q.—But sailors are born winchmen, are not they?

A.—Sometimes, but not about India.

Q.—Not in India?

A.—No.

Q.—It would have paid, would not it, to get the men from this country?

A.—Well, I do not know.

Q.—Were you compelled to use Indian winchmen?

A.—Yes; I understood it was all a native crew.

Q.—It was all to be a native crew?

A.—Yes.

Q.—Except the engineers and dredging masters?

A.—Yes.

Mr. Billimoria.—Did you find any of them unsatisfactory?

A.—No, after I had them educated, I have nothing to say against them.

Q.—They were quite as good as anybody who could have come out from this country?

A.—Just as good.

Sir Frederick Hopkinson.—I am glad you got that out, because that is exactly what I was told on the dredgers out there—that the men were perfectly satisfactory?

A.—Perfectly satisfactory. I could not wish for better men.

Q.—Would you confirm what was told me in Bombay, that the crew generally, and engineers of the dredgers were quite satisfactory?

A.—Well, I would not say they were at all satisfactory.

Q.—You would not say what?

A.—I would not say they were at all satisfactory.

Q.—You must have misunderstood me, because just now you said they were satisfactory.

A.—The crew.

Q.—And the engineers?

A.—I do not consider the engineers as part of the crew.

Q.—You differentiate between the crew and the engineers?

A.—Between the officers and the crew

Q.—You say the crew are satisfactory?

A.—Yes.

Q.—And the engineers?

A.—They were not just exactly what they ought to have been.

Q.—Not quite as good as you would have liked?

A.—Not what I would have liked them to have been.

Q.—So long as you got the revolutions out of the pumps of the cutter, it did not matter very much?

A.—No, but still at times I would like a little more energy out of them—the engineers.

Mr. Billimoria.—Were the engineers local men, or sent out from here?

A.—Sent out from London.

Sir Frederick Hopkinson.—I take it you cannot suggest anything now in the way of improvements for working in the coming season, if it is decided to work the dredgers?

A.—Nothing whatever.

Q.—You are perfectly satisfied that you have done everything—as it was put to us in Bombay—that was humanly possible?

A.—That the machine will do.

Q.—You might at the same time give us your general opinion of the "Sir George Lloyd" as a dredger?

A.—She is a first-class machine.

Q.—You would not wish to alter her in any way?

A.—I do not think you could.

Q.—You think she is as good a machine as could be built?

A.—Yes.

Q.—Do you say the same with regard to the " Colaba "?
A.—The " Colaba " we have had some trouble with, but I cannot exactly point out where the trouble arises. She suffers from vibration.

Q.—There appears to be a little weakness in the hull of the ship, and you had a lot of vibration, which was shown by the chimneys coming together?
A.—Yes.

Q.—Has it ever occurred to you that there is a possible air lock in the suction pipe of the " Sir George Lloyd," and also of the " Colaba "? You have got the pipe coming up at the end of the ship like *that*, and going down to the centre of the pump like *that*. You have got an air vessel just *here*. Do you remember that?
A.—Yes.

Q.—But that the air vessel is below the top of the pipe. It is down *here*, and I believe it is not used for anything.
A.—The air vessel on the pontoon, are you speaking of?

Q.—No, on the suction pipe of the " Sir George Lloyd "?
A.—Directly above the pump?

Q.—No, on the suction side of the pump.
A.—On the suction side, but about 3 feet from the pump, going to the forward end of pump.

Q.—You know that it is blocked up? It has a plug in the top of it?
A.—No.

Q.—What is it?—It acts as a safety valve. There is a spring valve on top.

Q.—It is a spring valve?
A.—Yes.

Q.—Does it act?
A.—That I could not say.

Q.—Have you stood much at the outlet of the pipe of the dredger on the shore?
A.—No.

Q.—You have been interested enough to go and see it?
A.—Yes.

Q.—Frequently?
A.—Well, probably about once a week—nothing more.

Q.—Was it giving a full bore?
A.—At times. It all depended on the length of the pipe.

Q.—The length of the pipe did not vary much per week?
A.—Oh no, not per week.

Q.—When it was dredging 5,000 ft. did it give a full bore?
A.—At times.

Q.—Only at times?
A.—Just during the period when there may have been a little less material in the pipes. The pipes were getting a practically solid volume of heavy material, and that reduced it to half.

Q.—In your experience, what percentage of solid matter do you expect to get through your delivery pipe?
A.—I should say not more than 15 per cent.

Q.—15 per cent. would be rather an outside figure, would it not?
A.—Yes.

Q.—If you got 10 per cent. you would be doing pretty well?
A.—10 per cent. would be a very good average; that is, if it is continuous.

Q.—When it was found that this dredger was not giving its specified output, did you have any instructions to make any experiments to see if you could improve it in any way?
A.—No.

Q.—Were you told to run the cutter faster?
A.—No.

Q.—You were told nothing?
A.—Nothing.

Q.—You simply went on at the designed speed?
A.—Yes, I simply went on at the designed speed.

Q.—It would have been possible to have run the cutter faster, would it not?
A.—No; not on the material.

Q.—But, as the material varied, you could run it faster in some places than in others?

A.—If the material had been continuously consistent it would have been quite all right.

Q.—Why could not you run the cutter faster?

A.—We could not vary our speeds to suit the varying material.

Q.—Why not?

A.—We would have been too slow in varying them.

Q.—You had double horse-power on the cutter engine than what you were using?

A.—Yes.

Q.—Then why could not you have tried to work the cutter a bit faster?

A.—If we had worked the cutter a bit faster, we might have travelled about five feet quicker per minute, but that would have been no good.

Q.—You were making 12 revolutions a minute?

A.—Hardly 12; 11½.

Q.—Supposing you had worked up to 15 or 16 revolutions a minute?

A.—We could not do it; we could not get the speed up.

Q.—Why not?

A.—We had not the speed in the engine. The engine runs at 250 with 11 revolutions.

Q.—And you could not have increased that?

A.—We could have increased it, but we would have lost the power altogether.

Q.—But your engine had double the power which the cutter required?

A.—It was supposed to have.

Q.—You could have increased the speed of the cutter to make use of some of this power which you were not using, could you not?

A.—It would have been very detrimental to us on the hard material.

Q.—At any rate, you had no instructions to try any other methods?

A.—No.

Q.—Did you notice that the output fell off very rapidly, or to any extent, after you had got over 5,000 feet delivery pipe?

A.—Yes.

Q.—To what extent? For part of this season you were dredging at 7,000 feet?

A.—Yes.

Q.—What volume did you lose by the increased length of pipe?

A.—About half to three-quarters.

Q.—You mean you were only pumping at one-fourth the output?

A.—Yes, at times.

Q.—Due to the increased length of pipe?

A.—Yes, due to the increased length of pipe. You understand that with the short length of pipe our average pressure was 30 lbs. per sq. inch.

Q.—Average pressure where?

A.—On the discharge. With the increased length of pipe to a minimum it was 60 lbs. pressure. We were having then about 35 per cent. of slip in our engine.

Q.—In the pump?

A.—Yes. The material was so heavy that we could not put it through.

Q.—To go to Back Bay for a moment, the " Kalu " went out to dredge from Back Bay into the reclamation. You were in charge of that, I believe, were you not?

A.—Yes.

Q.—The first season's work resulted in a total output, I think, of about 15,400 cubic yards for a whole season's work?

A.—Yes.

Q.—The output of the " Kalu " at Sewri was designed at 1,500 cubic yards an hour?

A.—Yes.

Q.—So that, putting it into quantity, she did about 10 hours' work during the whole season she was in Back Bay. Would you give us the reason for that, as you were in charge of the dredger?

A.—The first thing is that we had to make flotation for her. We only had an hour and a half each day.

Q.—She was expected to work in a place where, if she had been left at low water, she would have grounded?

A.—Yes.

Q.—That would have been a very unsafe thing to do?
A.—Yes.

Q.—It would have probably ended in wrecking the dredger?
A.—Exactly.

Q.—Then you had an hour and a half at each tide?
A.—No—per 24 hours.

Q.—You only worked single tide here?
A.—Yes. We could do nothing in the dark there.

Q.—You had an hour and a half in which to take up your moorings, do the work, and get out again?
A.—Yes.

Q.—Would it not have been advisable to have taken a drag dredger there in small pontoons and to have dug a hole for you to go in and float?
A.—We had none suitable.

Q.—Did not the Improvement Trust or the Dock Board have anything suitable?
A.—No. I do not think there was a dredger suitable in the whole place.

Q.—Therefore, because you had not a drag dredger, or because you had no means of doing it, the dredger was kept the whole season doing a day's work?
A.—Yes.

Q.—Was not that very unsatisfactory to you?
A.—It was, but we could do nothing else.

Q.—That was all you could do?
A.—That was all we could do.

Q.—You were carrying out orders?
A.—Yes.

Q.—The next season, I think, the " Kalu " did about 373,000 yards, did she not?
A.—For the whole season.

Q.—Was she worked single-shift or double-shift?
A.—Double-shift. The double-shift constituted a little over a single-shift, the pipes being aground at low water.

Q.—Were the pipes aground at low water?
A.—Yes.

Q.—So that actually, although you were nominally working double-shift, you were actually only working single-shift hours?
A.—Yes.

Q.—Therefore, from that point of view, your output was not too bad?
A.—No. It was not too bad at all for the hours we worked and the position we were in.

Q.—Is that going to apply in the future?
A.—I cannot say.

Q.—Which pipes took the ground?
A.—A thousand feet of them took the ground from the gantry.

Q.—So the gantry has not relieved you of the pipes going aground at low water?
A.—No.

Q.—You still have that trouble?
A.—We still have that trouble, and always will have it.

Q.—Is there any reason why you should not pump through the pipes when they are on the ground?
A.—You could pump through them, but the trouble is the movement of the pipe. One end of the pipe was practically on the ground at low spring tide—at the bend of the pipe.

Q.—I see what you mean—your connection from the dredger to the pipes?
A.—Yes, at the end of the first length.

Q.—You would have to swing with an arm, so that you would be free to float?
A.—Yes.

Q.—In the proper direction?
A.—No, about 1,000 feet from the end of the ship.

Q.—There is one other question which I want to ask you. Someone suggested that there was a lot of leakage from the pipes in the harbour dredging. Is that correct?
A.—Yes. You cannot avoid that.

Q.—What I want to get at is, was it an undue amount of leakage?
A.—No.

Q.—Was it normal? Was it anything more than you would expect?
A.—No, it was nothing more than you would expect.

Q.—You have nothing to complain of in the construction of the pipes?
A.—No.

Sir M. Visvesvaraya.—Can you give a percentage of what was lost, roughly?
A.—I could not possibly give it.

Sir Frederick Hopkinson.—It would be very small?
A.—Very small. Probably the greatest part of it might not be as thick as this pencil.

Q.—It would be just the ordinary thing that you would expect?
A.—Yes, just the ordinary thing that one would expect.

Mr. Billimoria.—You said something just now about working the " Kalu " under orders. You said the output was very unsatisfactory, but that you were helpless as you had to work under orders. What were your orders, and whose orders were they?
A.—Mr. Brims'. The orders were to work as long as possible and to get the greatest amount of work done.

Q.—Did you bring to Mr. Brims' notice the various things which caused the unsatisfactory working?
A.—Well, it is not unsatisfactory working.

Q.—The various things which were pointed out by Sir Frederick just now, such as not having pontoons, or other arrangements, so that you were not able to work the dredger? Were all those matters pointed out to Mr. Brims?
A.—I do not grasp your question.

Sir Frederick Hopkinson.—This is purely a physical thing, Mr. Billimoria. In the first place, they could only work for an hour and a half on the top of the tide, because there was not sufficient water to float them. Then, when they did get a floating place to lie in, their delivery pipes went aground at low water and they could not work at low water then; so they had to wait until their pipes floated. There was no way out of it. It was due to the situation of the place.

Mr. Billimoria.—Did not they anticipate that situation?

Sir Frederick Hopkinson.—I suppose somebody did.

Mr. Billimoria.—Who was it who did not anticipate it?

Sir Frederick Hopkinson.—You cannot blame anybody. The thing is that they changed their methods. They started dredging in Back Bay when originally they had no intention of dredging there at all. (*To the Witness*): When you went out there, there was no thought of dredging in Back Bay, was there?
A.—No. It was all inside.

Q.—Was your advice asked about dredging in Back Bay?
A.—They asked me if I could do it, and I said, Yes. There is nowhere where you cannot dredge as long as you have the material, and the depth of water, and a machine with which to do it.

Mr. Billimoria.—Was any investigation made before the " Kalu " was shifted over there?
A.—Yes. All soundings and borings were taken.

Q.—And it was known, was it, that she would only be able to work for a few days in the year at the time she was taken over there?
A.—Yes, to begin with.

Q.—That was all anticipated?
A.—Yes, to begin with, but we did not anticipate that it was going to be so long—the whole season.

Sir Frederick Hopkinson.—If I remember rightly, Sir George Buchanan, in one of his reports said a similar thing had been done at Sewri in four or five days, and here it was going to take a little longer?
A.—Yes.

Q.—Instead of taking a few days, it took a whole season—seven months?
A.—Yes.

Q.—And the money spent on that seven months' work was practically all thrown away?
A.—Yes.

Q.—It produced no effect?
A.—No.

Mr. Billimoria.—That is all I want.

Sir Frederick Hopkinson.—With regard to the mud which you were pumping from the harbour, I suppose when it was discharged into the reclamation it was really about the consistency of dirty water?

A.—Exactly—just dirty water.*

Q.—It was very poor stuff for making a reclamation?

A.—Very poor.

Q.—You could not find worse material?

A.—No, I do not think you could.

Q.—It would take years for that properly to dry, if it ever did dry, even if it were put into the open?

A.—Yes.

Q.—It is very bad material indeed for making reclamation?

A.—Yes, that top part.

Q.—The clay, of course, is good?

A.—Yes.

Q.—But the bulk of the material at the southern end is of mud?

A.—Yes. There is probably about 10 per cent. or 15 per cent. of it hard at the bottom.

Q.—Did you see the dredger tried at Renfrew?

A.—Yes.

Q.—You attended the trials?

A.—Yes.

Q.—Did you think they were extensive and satisfactory?

A.—Well, satisfactory as far as I was concerned.

Q.—You thought the dredger worked all right?

A.—Yes.

Q.—Do you know the place where they try dredgers?

A.—Yes.

Q.—Had you ever seen a dredger tried there before?

A.—Yes, many.

Q.—What sort of material is it?

A.—Soft silt.

Q.—Not clay?

A.—No.

Q.—Is it the usual place for testing dredgers?

A.—It is the usual place for testing suction dredgers.

Q.—I suppose some hundreds of dredgers have been tested almost on this particular spot?

A.—Not exactly on that particular spot.

Q.—But near it?

A.—Probably within a mile of it.

Q.—There is a mile there where they test dredgers. Practically the whole of the dredgers of the country are built on the Clyde?

A.—Yes.

Q.—And they are all tried in the same spot?

A.—Yes.

Q.—This material has been dredged, and dredged and dredged over and over again?

A.—Yes. A great amount of material has been taken away in barges, but similar material still remains.

Q.—There was nothing in the nature of solid clay there?

A.—No.

Q.—So that nobody knew at the end of the tests that the dredger would dredge 2,000 yards of solid clay an hour?

A.—It was measured.

Q.—Yes, but it was not solid clay. Therefore, it could not have been measured?

A.—No.

Q.—They said at the tests they got 3,700 cube yards an hour?

A.—Yes.

Q.—And to do that the percentage of material varied from 39 to 41 per cent.?

A.—Yes.

* NOTE.—Mr. Spiers' notes that he was referring at this point to the working of the "Kalu" at Sewri.

Q.—If, as you say, 10 per cent. is a reasonably fair output, it would mean that the quantity which the dredger could ever hope to get would be about 1,000 yards an hour. They say that in the tests they got from 39 per cent. to 41 per cent. of solid matter?

A.—Yes.

Q.—Did you ever see such a thing? Did you see these tests?

A.—Yes.

Q.—It must have been almost solid material?

A.—You could not see anything at all about it, as a matter of fact.

Q.—Why not?

A.—The short pipe at the end of the vessel was only 12 feet long.

Q.—And underneath the vessel?

A.—No, direct straight out from the stern.

Q.—You could not see the outlet?

A.—Yes. You could tell nothing about it. At the speed at which it was coming out it might have been solid or it might have been nothing but water. It was dirty.

Q.—Dirty water?

A.—You could not say that it was.

Q.—Could you not see the actual outlet of the pipe?

A.—Yes.

Q. You did not get lumps of clay in it?

A.—You could not tell. The speed of the discharge was about 1,000 feet per minute. You could not tell what was coming out; it might have been solid, but it was only water as far as you were concerned.

Q. You appreciate my point? The claim made for the tests is that they got from 39 to 41 per cent. of solid matter. That would be ascertained from the area from which they dredged and which they measured afterwards?

A.—Yes.

Q.—You told me just now that you thought 10 per cent. would be a reasonably regular output?

A.—Yes.

Q.—That would be about one-fourth of what they got at the trials?

A.—Yes.

Q.—That would give 1,000 yards an hour?

A.—Yes.

Q. The dredger can do 1,000 yards an hour?

A.—Yes, she can do that.

Q.—So there seems to be very little difference between the tests as made on the Clyde and what she is doing out there, allowing for the different quality of material. In one case you are getting 40 per cent. and in the other you are only going to get 10 per cent.?

A.—Yes.

Mr. Billimoria.—In what respect was the test on the Clyde a guide for regular pumping in Bombay Harbour? How would it compare? Was the test on the Clyde a suitable one for comparison with the material which this dredger was expected to dredge in Bombay Harbour?

A.—No. I do not consider it was.

Q.—Then were the authorities justified in passing the dredger as satisfactory?

A.—That will have to be explained by Sir John Biles.

Q.—Did anyone anticipate that the dredger would not give the required output?

A.—I had nothing at all to say in that matter. I was only an employee.

Q.—The test which was applied on the Clyde was by no means a satisfactory one in reference to the results which this dredger was expected to give in Bombay?

A.—I suppose the builders and the naval architects considered it was, but I cannot say anything about that.

Q.—Without knowing the material in Bombay?

A.—I cannot say anything at all on that matter as far as I am concerned.

Sir Frederick Hopkinson.—The material at the test was totally different, so far as you could see, from the clay which you had to cut in Bombay?

A.—It was the same material over the top at Bombay.

Q.—The top cut?

A.—Yes.

Q.—Silt?

A.—Yes.

Q.—But not in clay?
A.—No, not in clay.

Q.—The clay at Renfrew, I take it, would hardly need a cutter?
A.—No.

Q.—Therefore, it all boils down to the fact that the cutter does not seem to be able to cut down more than 800 to 1,000 yards an hour. Is not that so?
A.—Not of good clay.

Q.—Because if you could cut it you could pump it?
A.—Yes. If you could cut it you could pump it.

Q.—Your cutter does not seem able to cut it at a greater rate than from 800 to 1,000 yards an hour?
A.—No.

Q.—If your cutter had been cutting that clay at 2,000 yards an hour, there is little doubt that your pump would have delivered that quantity?
A.—There is no doubt that it would have delivered it quite easily. The pump is quite efficient to do 2,000 yards an hour.

Mr. Billimoria.—Was not the cutter designed for the material?
A.—That is a thing which I really cannot go into. That is a matter which concerns the builders.

Sir M. Visvesvaraya.—What precisely were your duties on the "Sir George Lloyd"?
A.—My duties on the "Sir George Lloyd" were as a dredger master in charge of the floating plant, supervising everything, under the Development Directorate.

Q.—Were you responsible for the daily output and for the cost of execution?
A.—Well, practically.

Q.—Did you take out the quantities dredged daily?
A.—No. The marine surveyor did that.

Q.—Or weekly?
A.—The marine surveyor did it daily.

Q.—Did you know how much you were dredging daily, or what the output was per week, or per month?
A.—No.

Q.—If you were responsible for the quantity dredged, was it not necessary for you to keep yourself informed of the output?
A.—I ought to have kept myself informed, but it was probably weeks afterwards before I was informed. I was interested in other things. I never remembered any of these things.

Q.—You were informed weeks afterwards?
A.—Yes, if I asked.

Q.—You did not know at what cost the dredging was being done?
A.—No.

Q.—You are aware that the dredger was estimated to give 2,000 cubic yards per hour?
A.—Yes.

Q.—And there were to be five million cubic yards per season?

Q.—You know they are getting only about 25 per cent., or a little more than that, at present of the promised output?
A.—Yes.

Q.—What do you think is the reason of the failure of the dredger in that respect?
A.—The failure of the dredger is due to the material with which the dredger has to deal.

Q.—But was not the material it had to deal with considered by the manufacturers when they designed the plant?
A.—I should think it would be.

Q.—Usually it is done, is it not?
A.—Usually it is done.

Q.—Do you think it was done in this case, or what is your opinion?
A.—I could not say that.

Q.—You have no information on the point?
A.—No, I have no information whatever regarding that.

Q.—You do not want to commit yourself?
A.—No, I do not want to commit myself. I do not know anything at all about it. You must understand that when that vessel was built or designed I was just an ordinary employee on the works, and I was not consulted.

Sir Frederick Hopkinson.—What were you?

A.—Engineer.

Sir M. Visvesvaraya.—But you are not aware that the output is only about a quarter or one-third of what was expected, and that the cost of working is nearly double the original estimate. You also know that the dredger cannot deliver the quantity promised into the middle blocks—blocks 3, 4, 5 and 6, at least not at the speed specified?

A.—It can be delivered, but they will have to shift the pipe line.

Q.—They will have to bring it nearer?

A.—Yes.

Q.—Is it possible to shift the pipe line?

A.—It is possible, at a cost.

Q.—It means money?

A.—It means money.

Q.—And if the delivery pipe is extended, do not you think that the quantity delivered will be much less than it is at present

A.—No, I do not think it will, so long as we have the booster working continuously.

Q.—It is said by the engineers that the middle blocks cannot be filled. You do not agree?

A.—I cannot say. I have no distances as regards the middle blocks, or the position in which they are likely to put their pipes

Q.—In any case you are aware that the dredger has failed in several respects to give satisfaction?

A.—Well, the dredger has failed, certainly, but it is the nature of the ground which has failed the dredger.

Q.—I am coming to the reasons; there are reasons, of course, but the dredger is not giving the required output. It is giving very much less than the promised output?

A.—Yes.

Q.—Is there any other reason besides the quality of the material which accounts for the dredger not giving the estimated output?

A.—No, there is no other reason. It is simply the ordinary course of events, and bad weather, and suchlike.

Q.—What is the maximum output which the dredger has given under your handling?

A.—Under my handling I think it was 1,200.

Q.—For what period?

A.—You could not determine the period.

Q.—Was it for one day, or for a week, or for a month?

A.—It varies in an hour.

Q.—What is the maximum average which you have had for a week?

A.—I believe, when we were on good working ground, about 1,200 per hour.

Q.—During the time you worked?

A.—Yes.

Sir Frederick Hopkinson: It has been stated, and shown, that your percentage of lost time was about 36 per cent.; that is, for removing anchors, taking water on board, and various other things. Is that about the normal?

A.—That is about the normal in these vessels.

Q.—There is nothing special about that?

A.—No.

Q.—You would expect to lose approximately one-third of your full working time. That is to say, if your working time is 12 hours, you would not expect to get more than eight or eight and a-half hours' actual pumping?

A.—Quite so. I would have you understand that every 80 feet we travel we have to stop. We have to take a pontoon and put it in the line, and so on. For every 80 feet we work we have to put in a pontoon. That may mean half-an-hour, one hour, or three hours, according to the conditions of the weather.

Q.—No experienced man in dredging would reckon that; if he was going to pay his men 16 hours a day, he was going to get more than two-thirds of that as actual pumping time?

A.—I do not see how you could avoid it.

Q.—No experienced man would ever expect to get more than two-thirds of his total time as pumping time?

A.—No.

Mr. Billimoria.—If the total output was expected, that would be very unwise—all the 16 hours?

A.—It is impossible to do the like of those things.

Q.—Anybody calculating on that, therefore, would not be an engineer at all?
A.—No, I do not consider he would.

Q.—Any calculations based on that theory would be exploded?
A.—Yes.

Sir Frederick Hopkinson.—The quantities dredged per hour do not seem to have varied so very much as the distance pumped has varied. For instance, there is a week on the 25th November, 1925, when the quantity dredged was 1,007 yards an hour and when the discharge line of pipe was 6,207 feet; whereas the previous week the total length was only 5,900 feet and she only dredged 498 yards an hour, which is half the quantity. This rather confirms what I suggested to you—that the length of the pipe did not affect the output so much as people thought. For instance, there is one week where the pipe was 7,813 feet and she dredged 436 yards an hour. The next week, with only a difference of 280 feet in the length of the pipe, the output was double, and then the next week, when the length of the pipe was only 5,919 feet, the output was 652. I do not understand it. The week after that the length was 6,189 and the output went up to 922. There is something wrong there. This cannot all be correct?

A.—That may have been at the beginning of a fresh cut.

Sir M. Visvesvaraya.—You said that the partial failure of the dredger was due to unsatisfactory clay, or to the clay being too stiff?

A.—It was due to unsatisfactory material.

Q.—Was it due to insufficient engine power?
A.—No.

Q.—Was it due to the bad design of the cutters?
A.—No.

Q.—Was it due to the insufficient depth of the clay material?
A.—Partly to the insufficient depth of it, in many cases.

Q.—Part of the reason is that the depth of material was insufficient?
A.—Yes.

Q.—You know of no other reason?
A.—There is no other reason.

Q.—Could not the engine have been made strong enough to work through the clay?
A.—The engine is quite strong enough to do all that is necessary. As a matter of fact, in many cases it is too strong.

Q.—If it is strong enough, why should it not cut and draw the material?
A.—We have got an anchor hold, and we have only a certain weight to hold that, and if we draw that weight then we may be finished for hours.

Mr. Billimoria.—You do not attribute any defect to the dredgers themselves?
A.—No, none whatever.

Q.—It is all due to the material?
A.—It is all due to the material, as far as I am concerned.

Sir M. Visvesvaraya.—When a dredger, or any plant of that description, is supplied, is it not usual to have the tests carried out on the site?

A.—No. The tests are usually carried out where the builder has made up his programme to carry them out.

Q.—But are not the tests as to output carried out on the site, as a general rule?
A.—No.

Q.—Do you know that in the case of the "Kalu" in Bombay harbour itself they had those tests made in the harbour?
A.—Yes, I will admit that.

Q.—Then why do you think that in this case the usual guarantee should not have been carried out?

A.—That was an unusual contract.

Sir Frederick Hopkinson.—In what respect was it unusual?

A.—The vessel had to take out so many yards per hour for three months before the Bombay Port Trust would take over the vessel.

Q.—That was a term of the purchase?
A.—Yes.

Sir Frederick Hopkinson.—And that, of course, would have to be paid for?

Mr. Billimoria.—Would not that be a satisfactory term of the contract?
A.—It all depends on the people who are having the article.

Q.—Even if he had to pay a little more, you would know that you were standing on firm ground?
A.—Yes.

Q.—And it would be advisable to pay a little more and be sure of what you were getting?

A.—Yes.

Sir M. Visvesvaraya.—That is the usual thing?

A.—No, it is the unusual thing.

Sir M. Visvesvarayya.—The usual thing is to test on the site.

Sir Frederick Hopkinson.—He says it is the unusual thing.

The Witness.—It is unusual to test on the spot.

Sir Frederick Hopkinson.—It is usual to test at the builder's.

Sir M. Visvesvaraya.—But it was done in the case of the "Kalu"?

A.—Yes.

Sir Frederick Hopkinson.—But he says it was exceptional.

Sir M. Visvesvaraya.—I should not agree to anything of that sort, because it is taking risks.

Sir Frederick Hopkinson.—You said just now, in answer to a question I put, something about the engineer being unsatisfactory. Does that refer only to a particular man on the "Colaba"? It has nothing to do with the "Sir George Lloyd"?

A.—I can hardly tell you exactly what it was, but I will tell you this—that there was not enough energy in him.

Q.—The weather was very hot, I suppose?

A.—I suppose that takes a lot out of a man.

Sir M. Visvesvaraya.—In the case of the "Kalu" they had stipulated that 10 per cent. of the value should be paid after the vessel had been in operation at Bombay for three calendar months to the satisfaction of the Trustees of the Port Trust. In this case there was no such stipulation. As you remark, the contract was unusual.

A.—Yes, so far as my experience went.

Sir Frederick Hopkinson.—You have not got it right. He says the contract for Sewri was unusual——

Sir M. Visvesvaraya.—No, no.

Sir Frederick Hopkinson.—The contract for Back Bay was the usual contract?

A.—The usual contract.

Sir M. Visvesvaraya.—You say that what was done in the case of the "Kalu" was unusual?

A.—Yes.

Q.—And that what was done in the case of the "Sir George Lloyd" was the usual thing?

A.—Yes.

Q.—That is to say, that people purchase plant worth a million pounds, perhaps, on the mere chance of it working satisfactorily and without any guarantees that it will give the required output?

A.—Yes.

Q.—Is that your experience?

A.—Yes.

Q.—It is not mine. Is it not the case, in the matter of any big plant, that a guarantee is given that the machine will perform its allotted task?

A.—That is usual. There is usually a guarantee that the machine will turn out its allotted task.

Q.—You say it was not done in this case because there was no stipulation in the contract?

A.—Not on the site.

Q.—There was none in the contract?

A.—We made no test in Bombay the same as was done on the Clyde. The Clyde test was carried out and passed as satisfactory.

Mr. Billimoria: Who was responsible for such a contract?

A.—I cannot tell you those things.

Q.—Is it an unusual system of contract, or the usual one?

A.—The usual.

Q.—The "Kalu" system is much more advantageous from the purchasers' point of view, is it not?

A.—Yes, from the purchasers' point of view, certainly, but much more expensive.

Q.—In the end which is more expensive—a dredger that fails or a dredger that works?

A.—I do not say that the dredger has failed so far.

Q.—If you get your required output, it pays you hand over fist?

A.—Yes.

Q.—If you get a quarter of the quantity which you expect to get, you lose heavily?

A.—Yes, but if you have the material there I have no doubt you will get the quantity.

Sir M. Visvesvaraya : But you cannot change the material. You have to adapt your machinery to the material?

A.—Yes.

Q.—Is it not usual for dredger makers to take note of the material in which a machine has to work?

A.—I understand it is usual. They usually have the products out there sent home.

Q.—Was that done in this case?

A.—I cannot say.

Q.—Was any complaint made to the manufacturers when the machine did not give the required output?

A.—That would go through the office; it would have nothing to do with me.

Q.—You do not know anything about it?

A.—No.

Q.—If the plant did not give the required output, and you could not make it work so as to give the required output, was it not your duty to report to your higher officers and ask them to consult the manufacturers?

A.—My higher officers had the daily reports given to them.

Q.—What observations were you taking from day to day in order to see whether the dredger was giving the promised output?

A.—We took soundings every day, and the position in which the dredger was.

Q.—But no calculations were made of the quantities?

A.—At the moment, no, but they were marked on the chart. They were charted every day and taken to the office and calculated.

Q.—At what intervals did you get the results? Did you get intimation of the results from the office?

A.—Probably once a month, if I asked for them.

Q.—They were not sent to you in the ordinary course?

A.—No.

Q.—You were working, then, without knowing what the machine was producing?

A.—I was working there with the machine producing as much as the machine was capable of producing.

Q.—I quite admit that; you were doing your best.

A.—What the result was I could not determine.

Q.—What measures do you recommend should be taken to rectify these defects in future? You are prepared to work the dredger in three shifts in future, are you not?

A.—I cannot tell you that. I have no information as regards what the higher officials are going to do.

Q.—Supposing you get orders to work in three shifts, you have no objection to doing so?

A.—It makes no difference to me.

Q.—By how much do you think you can increase the output by working three shifts?

A.—Probably 25 per cent.

Mr. Billimoria : 25 per cent. by employing three shifts?

A.—Yes.

Q.—25 per cent. of what—of the total present output?

A.—Yes, but the expenses will go up a great deal more.

Sir M. Visvesvarayya : By how much?

A.—I expect they will go up by 75 per cent.

Q.—25 per cent. more production?

A.—Yes.

Q.—And 75 per cent. more expenditure?

A.—Yes.

Q.—Why is that? You have the same engine power.

A.—You cannot do your work in the dark. It takes about 100 per cent: more to do it in the middle of the night than in the middle of the day.

Sir Frederick Hopkinson: But you are already beginning at midnight, are you not?
A.—No. We go on till midnight.

Q.—You get six hours' darkness.
A.—We may have a lot of free hours before we get the pontoon in.

Sir M. Visvesvaraya: What records do you keep on the dredger?
A.—Records are kept of the total hours worked, and the repairs done during the day.

Q.—Did you take any steps to measure the quantity actually delivered into the area reclaimed?
A.—No. That comes under the Civil Engineering Department.

Q.—At what intervals were those measurements being taken?
A.—I cannot say.

Q.—You only knew it at the end of the year?
A.—I only knew it at the end of the year.

Mr. Billimoria: According to you, three shifts will not be a paying proposition?
A.—I do not think so.

Q.—There will be more expenditure than output?
A.—I think it will be much better to carry on when there is a possibility of doing so and paying the men overtime.

Sir Frederick Hopkinson: That is really what is proposed.
A.—When one shift drops off it takes some time before the other catches on again, even though the machine is working. Each man has a different idea of working the machine.

Mr. Billimoria: You mean that each shift should work a few more hours and be paid overtime?
A.—Yes.

Q.—You think that is better than working three shifts?
A.—Yes, I should say so. Many times when the weather is suitable and everything is favourable a man could go on for three hours longer. The following night the conditions may not be favourable at all.

Sir Frederick Hopkinson: That is a matter of working experience in which you ought to be consulted?
A.—Yes.

Q.—Nobody can lay down a regular law about it. You must work according to the conditions and circumstances?
A.—Yes, but they must pay for that, which they will not do.

Mr. Billimoria: Your opinion is based on your experience of the working of the arrangements as you saw them in Bombay itself, and you are absolutely confident that working three shifts will not be a paying proposition?
A.—I do not think it will.

Sir Frederick Hopkinson: That is working three shifts every day?
A.—Every day.

Q.—You suggest, however, that three shifts should be worked wherever it is possible and practicable?
A.—Yes, if it is possible.

Q.—In some cases three shifts may be a disadvantage when you cannot go on working?
A.—Yes.

Q.—And you would have to go on paying wages. In the other case you, as dredging master, would be able to say "We are not going to work from 2 o'clock or 3 o'clock or 4 o'clock to-day." Therefore you would save expense. You would judge of each contingency as it arose. Generally speaking, however, if you worked three shifts when it was practicable and proper to do so, you would gain an increased output at a smaller cost?
A.—Yes.

Mr. Billimoria.—Where would you draw the line? How would you differentiate? At what stages would you differentiate?
A.—It all depends on the weather.

Q.—But you can never foretell the weather?
A.—No.

Q.—You never can tell whether or not it is going to rain this afternoon?
A.—No; you can never tell that.

Q.—Then what is your guide?
A.—Why should we have a full staff of men there if they can do nothing?

Q.—What is your guide in deciding about anything? It is mere speculation, is it not?

A.—No, it is not speculation. It is better to pay men overtime when they can work, than to have men there waiting and being paid when they cannot work.

Q.—Therefore you are not in favour of a regulation three shifts, but you are in favour, whenever the occasion admits of it, of asking the men to work overtime. Is that what you recommend?

A.—Yes.

Sir Frederick Hopkinson.—That is what is proposed. You do not propose that there shall be three definite shifts of men, but that there shall be two shifts of 12 hours a day, in which case you can work as long or as short as you find it necessary or desirable to do so?

A.—Yes.

Q.—That is really what you recommend?

A.—Yes, but they will have to have stipulated hours.

Q.—You do not want to have three eight-hour shifts?

A.—No.

Q.—We are all thinking the same thing, only it is being put a little differently. What we mean is to work 24 hours a day so long as it is practicable and possible to do so with two full shifts of men. On one day it may be advisable and possible to work 24 hours; on the next day it may not be practicable to work 24 hours, in which case you would not pay the men, if they are not working?

A.—No, after a certain time.

Mr. Billimoria.—Would not the proposition of paying a bonus to the men be more encouraging to them to give a better output than asking them to work a couple of hours longer? Would not a bonus proposition appeal to the men more than longer hours?

A.—I do not think so.

Sir Frederick Hopkinson.—But you would have no objection to both?

A.—I have no objection to both. I think it would be a wiser proposition to pay both.

Q.—That is what I should do if I were there.

A.—It is a job to get the Bombay people to pay anything.

Sir M. Visvesvaraya.—What are the defects of the "Colaba" which you have noticed?

A.—There are no defects in the "Colaba." It is only the structure of the "Colaba" which seems to be a little weak.

Q.—The vibration?

A.—Yes.

Q.—Can nothing be done to stop that?

A.—We have eliminated about 80 per cent. of it, I should say.

Q.—Is reconditioning necessary?

A.—We have eliminated that altogether by the extra which we have put into it. We want a bit more yet to make up the total.

Q.—You expect to do that?

A.—Yes. We expect to have that done this season.

Q.—Why do you not keep touch with the volume dredged from week to week as compared with the calculated output? Would it not be a proper guide to you to enable you to improve your working from day to day?

A.—No, I do not think so. My guide is the pressures of work.

Q.—You have no test for gauging the actual output?

A.—No, I have none. There are gauges. I do not know what they do with them.

Q.—Is it not usual occasionally to have temporary tanks in order to measure the output?

A.—No.

Q.—In other dredgers, occasionally?

A.—No.

Q.—Then how do you get the correct quantity?

A.—In various ways. Every engineer has his own idea of how to take tests.

Q.—Have you read the description of the Clyde tests?

A.—Well, I have had them.

Q.—Are they satisfactory?

A.—I could not say. As far as the builders and the naval architects are concerned, they are quite satisfactory to them.

Q.—For the future, what are the measures you would take to improve the working? You say three shifts if possible?

A.—No. I am not going to say that I would not go in for three shifts at the moment.

Q.—Working longer hours if possible?

A.—Yes, longer hours if possible.

Q.—You would not make any change in the engines or in the cutters?

A.—No.

Q.—Then there is no chance of materially increasing the output?

A.—Not unless we get better material. It all depends on the material we get.

Mr. Billimoria.—And as far as your present experience goes that is not satisfactory?

A.—No, not for the material with which we have to deal.

Q.—I mean the material?

A.—It is not satisfactory for the dredger we have got.

Sir M. Visvesvaraya.—The cost at which it was expected to deliver pumped material was about five annas per cubic yard. That was the original estimate?

A.—Yes.

Q.—According to last season's experiments it was about eight to nine annas?

A.—Yes.

Q.—Do you think there is any chance of reducing the cost in future?

A.—It all depends on the material. The whole thing depends on the class of material we get.

Q.—Do you keep touch with the costs of working?

A.—No.

Q.—Nor quantities?

A.—It is all worked out for me.

Mr. Billimoria.—Can anyone say that the material is likely to be suitable in the future?

A.—That will have to be determined on the borings.

Q.—Did Sir Geoge Buchanan approve of your appointment as dredging master?

A.—I cannot say. I was appointed by Mr. Lewis. Whether he referred to Sir George Buchanan or not I cannot say. I was in Bombay when I was appointed.

Q.—Mr. Lewis was the representative, in a manner, of Sir George Buchanan as chief engineer in charge of the works?

A.—Yes.

Q.—Therefore if there was any objection to your appointment Sir George Buchanan would have objected to it?

A.—Certainly.

Q.—Did he know anything of your qualifications?

A.—I cannot say. I suppose he had.

Q.—Did he ever suggest that you were not competent or capable of handling the dredgers?

A.—No, not to me.

Q.—I am referring to Sir George Buchanan. Did he ever suggest that to anyone else?

A.—No.

Q.—Did he record it anywhere?

A.—No.

Q.—Except in the last press note?

A.—Not to my knowledge. I have had nothing but ordinary conversation with him.

Q.—In reply to a question by Sir Frederick Hopkinson you said it was no part of your duty to prevent the leakage on account of not having sealed the wall?

A.—It was nothing to do with me.

Q.—Why was it nothing to do with you?

A.—That was the Civil Engineers Department, or the head of the Dredging Department. I stop at the end of the floating pipeline. My duties stop there.

Q.—Did you report it to the civil engineer in charge?

A.—No, the civil engineer sees that.

Q.—Merely because he sees it do you think it is not your duty to report it?

A.—No, it is not my duty.

Q.—If you happen to see a material defect in a work of this magnitude do you not think it is prudent or advisable to report the matter to the civil engineer or to bring it to his notice?

A.—Certainly.

Q.—Did you speak to him?

A.—We had many conversation, but nothing official.

Q.—Did he take any steps to remedy the defect?

A.—Yes, at times he did.

Q.—Had you any personal knowledge as to whether anybody had made any investigations with regard to the material which these dredgers were expected to dredge?

A.—No further than the party's name. It is on the borings. I understand it was Mr. Kidd, whoever he may be.

Q.—Beyond that, no other independent investigation has ever taken place?

A.—Not to my knowledge.

Q.—In reply to Sir Frederick Hopkinson you said you submitted your daily reports to the office?

A.—Yes.

Q.—And Sir Frederick remarked that the Government have stated that they did not know anything of these. Do you know if your papers or reports ever reached the Government?

A.—They always reached the office.

Q.—That does not mean they reached the Government?

A.—That I cannot say. They were out of my hands after they went to the office.

Q.—Who is responsible in the office?

A.—They are supposed to go to Mr. Brims.

Q.—Are they filed?

A.—Yes, I understand they are filed.

Q.—Is no action taken on them?

A.—I have no dealings with the inner part of the office whatever.

Q.—Do you know whether any action was taken on them?

A.—I cannot say anything about that.

Q.—If you reported that the output was not satisfactory, did anybody take any pains to find out why it was not satisfactory?

A.—If the report was not satisfactory they used to come down and have a talk with me about it.

Q.—Was it brought to the notice of the Government of Bombay?

A.—Yes, I expect so.

Q.—Do you know?

A.—No.

Q.—How long have you been on this dredger?

A.—About three and a half years.

Q.—During that period we find that the average output varies considerably from time to time?

A.—Yes.

Q.—Can you assign any reason why that is so?

A.—It varies according to the material that we come up against. At times we come up against very hard material, and it takes 50 per cent. longer to deal with it.

Q.—It is not to be ordinarily expected that, when a machine is working, it should give the required output, except in the event of serious contingencies?

A.—This is a serious contingency which we are up against—this hard material.

Q. You come across such a serious contingency occasionally, but not every day?

A.—Yes, almost every day. This contingency occurs every hour.

Q.—So. according to you, the *summum bonum* of the whole conclusion would be that the material is very defective and is the main cause of the failure?

A.—It is the main cause as far as the dredger is concerned.

Sir M. Visvesvaraya.—In other words, the dredger was not adapted to the circumstances of the material?

A.—Exactly.

Sir M. Visvesvaraya.—Our next public session will be held on Wednesday, September 29, as at present arranged, by which time we hope that our Chairman will have rejoined us.

(Adjourned to September 29.)

The Committee assembled at 11 a.m. on the 29th September, 1926, all Members being present.

41st Witness, Sir J. H. Biles.

WRITTEN EVIDENCE.

It is proposed to confine these remarks to Questions 17, 18, 19 and 20.*

17. Were the specification and designs of Sir George Buchanan for the dredger " Sir George Lloyd " (hereinafter called the dredger) and the " Colaba " fit and proper for the intended work?

18. Did the makers guarantee that the dredger would discharge 2,000 cubic yards of soft clay per hour through a floating pipe line to a distance of 5,000 feet?

19. Did the dredger before delivery under proper test conditions in fact give the guaranteed output?

20. Was the dredger, when delivered, in all respects in accordance with the contract?

On 8th March, 1920, our first communication was made on the subject of the dredgers for the Bombay Back Bay Scheme the result of which was an interview which took place on 16th April between Sir John Steevens, Acting Director-General of Stores, Sir George Buchanan, and Sir John Biles. The result is embodied in Sir George Buchanan's memo. of the 16th April.

We prepared plans and specifications based on the outline specification supplied to Sir George Buchanan by Messrs. Simons in their letter of 12th September, 1919, and on 4th June, 1920: Messrs. Simons quoted to the Director-General of Stores for a dredger with electrically driven intermediate station, pipe line, etc. The dredger " Sir George Lloyd " was ordered on 15th June, 1920. It was found that the electric current could not be supplied at Bombay, and the scheme for an electrically driven intermediate station was in consequence abandoned. This change was approved of by the Governor of Bombay in a telegram to the Director-General of Stores on 3rd July. On the 15th July the order for the steam intermediate plant was placed with Messrs. Simons.

The work of construction was proceeded with, and Messrs. Meik and Buchanan received copies of all plans, which were returned to us with their comments.

Amongst other events in this connection an interview took place at Renfrew on 30th July between Sir George Buchanan, Mr Meik, Messrs. Simons' representatives, and ourselves at which the discussion of various items of detail took place in connection with the dredger, intermediate station, and pipe line. On 20th July a further conference took place at our office in Westminster at which, in addition to the foregoing, Mr. Lewis was present, and all the matters decided were noted at that time. Some of these matters required additional work which was subsequently authorised by the Director-General of Stores on 23rd August. Messrs. Meik and Buchanan were kept thoroughly posted as to the details of the work.

The vessels were launched and tried. The dredging trial of the " Sir George Lloyd " took place on 24th November, 1921, at which Mr. Meik representing his firm was present. The results of the dredging trials were that the amount dredged for two hours was at the rate of 3,701 cubic yards per hour. This material was pumped through a pipe line about the length of the vessel, and discharged through an open pipe at the stern. It is evident from this trial that more than sufficient quantity of the material to fulfil the contract requirement of 2,000 cubic yards per hour could be obtained by the cutter.

Two questions further arise.

(1) Was the material such that the contract of cutting 2,000 cubic yards of soft clay was fulfilled. The material cut is of a clayey nature easily cut by the cutter, and when the specimens were collected at the end of the delivery pipe and allowed to settle in the water as collected, they were found to be of a hard nature after the water was poured off. Further, this material when removed from the cutter after it had been stopped, was seen to be of a fairly hard clayey nature. We were therefore of opinion that this material more than fulfilled the condition of soft clay. Further this is the material available on the Clyde and has been used by us in all tests that we have conducted and has become a standard from which we can judge the subsequent performance on service. Having established that the cutter could produce the amount of material for the pump to draw, the question is: is there power enough in the pump to deliver 2,000 cubic yards per hour at the end of a 5,000 feet pipe line? The friction of this

* See Appendix I.

pipe line can be estimated and the amount of head necessary to be overcome can be determined. Our usual practice is to estimate the amount of head necessary to be overcome, and then to place an obstruction at the delivery end of the pipe and to pump only water by this obstruction. In this way the pump can be run against a selected amount of obstruction sufficient to produce a head equivalent to that which has to be overcome in the pipe line. We had to resort to this to determine the head which the pump could produce because it was quite impracticable to have a pipe line 5,000 feet long anywhere in the Clyde area.

On the 19th and 20th December, 1921, these water pumping trials were carried out with the result that a total pressure of 39 lbs. per square inch and a vacuum of seven inches were obtained. These are equivalent to a head of 97 feet. The question of what head would have to be pumped against to deliver through 5,000 feet of pipe line can be easily determined if water only is to be delivered at some assumed speed. Under such circumstances we estimate the head would be about 60 feet with water having a speed of 15 feet per second.

With reference to the additional head which would have to be overcome when spoil is in the pipe we estimate that when delivering 2,000 cubic yards per hour at 15 feet per second the head due to water and spoil through 5,000 feet of pipe line will be not more than 89 feet. Hence the power of the machinery was more than sufficient as it can overcome a head of 97 feet while 89 feet only has to be overcome to drive 2,000 cubic yards through 5,000 feet of pipe line per hour at 15 feet per second. The percentage of spoil under these circumstances is 10·4.

As confirmation of our estimate it may be pointed out that the " Sir George Lloyd's " records of pressure and vacuum on service ranging from 20th December, 1923, to 6th May, 1924, give a range of head of 86·0 to 110·9 feet when working with a pipe line varying from 5,200 feet to 7,500 feet.

To determine the actual speed of the water and spoil through this pipe line an assumption has to be made as to the relative speed of the impeller and the water. We know the revolutions of the engine and impeller, and we know by measurements of the rate of flow through a pump of similar size what this ratio is, and from these measurements we can determine that the speed in the " Sir George Lloyd " ranged from 14·1 to 14·8 per second. Hence the speeds of water in practice are not far from these assumed.

It is to be observed that with a speed of 15 feet per second when delivering 2,000 cubic yards per hour the proportion of spoil is 10·4 per cent. as stated above. With a velocity of 14·1 to 14·8 feet per second the proportion is 11·1 to 10·5 per cent. The actual amount of spoil measured as being removed over this period from December to May was 978 cubic yards per hour so that the actual spoil was only from 5·4 to 4·9 per cent. This demonstrates that on service the pump was not getting the amount of material necessary to deliver 2,000 cubic yards of solid per hour though it was pumping sufficient water this spoil against a head equivalent to what had been calculated as necessary to be overcome. If the spoil had been available the pump would have delivered it through 5,000 feet.

" Colaba."

The structure of the " Colaba " as built was almost the same in scantlings as the " Sir George Lloyd." The engines were exactly the same size and ran on service from 136 to 144 revolutions per minute from 13th December, 1924, to 16th May, 1925. The " Sir George Lloyd " gave no indication of vibration and her revolutions ranged from 140 to 150 on service from 26th December, 1923, to 15th May, 1924. It seems to be evident that any excessive vibration in the " Colaba " must have been due to circumstances which did not exist in the " Sir George Lloyd."

As the scantlings and machinery were the same and the " Colaba " being a shorter vessel was necessarily a stiffer structure, the cause of the vibration must be looked for outside of the hull or engines of the " Colaba."

So far as can be determined from the evidence or any other source available there seems to be no satisfactory explanation forthcoming of the cause of this vibration, and therefore it is not possible for any one to say wherein is the defect in the design to which the vibration can be attributed, if there is such defect. There was no vibration on the trial on the Clyde more than is usual in such vessels, or more than was in the " Sir George Lloyd." It seems, therefore, that the cause is one which is due to the pipe line or the motion of the water and spoil in the pipe. It has been stated that there is a motion in the water in the pipe line which is of wave nature which affects the pressure at the " Colaba " end of the pipe. This variation which is said to be momentary may cause the engines of the " Colaba " to vary in speed to such an extent and so rapidly as to cause vibration in the structure. This wave of pressure can only be due to variation in the supply of

material to the " Sir George Lloyd's " pump, which may be due to variation in the character of the material being cut.

Whatever may be the cause of this vibration, there does not seem to be any inherent defect in the design or construction of the " Colaba." No dredger structure is designed or constructed to withstand stresses due to abnormal vibration—such vibration must be caused by an abnormal vibrating cause which should be sought for and mitigated or removed—if excessive vibration is allowed to continue it will cause rivets to become loose and holding down bolts of the engines to slacken. To impute the blame to the structure without searching for the vibrating cause is not a satisfactory way of tackling the difficulty.

ORAL EVIDENCE.

SIR JOHN BILES, K.C.I.E., M.I.C.E.

Chairman :—Your name, I think, is Sir John Biles?
A.—That is so, John Harvard Biles.

Q.—You are a Naval Architect?
A.—Yes.

Q.—Employed by the India Office?
A.—Employed by the India Office for their work.

Q.—Was it on the 8th March, 1920, that the first communication was made to you on the question of the manufacture of a dredger for the Back Bay Reclamation Scheme?
A.—That is so.

Q.—Was that communication verbal or in writing?
A.—In writing.

Q.—From whom?
A.—From Sir John Steevens who was then Acting Director General of Stores of the India Office.

Q.—He at that time, of course, was in England?
A.—He was in England—in London.

Q.—On the 16th April, did Sir John Steevens, Sir George Buchanan and yourself have an interview?
A.—We did on that date.

Q.—The subject under discussion was this question of the dredger?
A.—The subject under discussion really was the relative duties that Sir George Buchanan and I were to undertake in relation to the construction of the dredger.

Q.—In the outline of the evidence which you have given to us you say that the result of that discussion is embodied in Sir George Buchanan's memorandum of the 16th April?
A.—That is so.

Q.—Have you a copy of that?
A.—I think you have in the files of the India Office a copy of that memorandum. We have a copy of it, but I think you have it already. (*Copy handed.*)

Q.—I think we had better go through this. The memorandum says : " At my meeting with Sir John Steevens on the 25th March, he informed me that orders had been passed that no contract for the dredger was to be placed until the whole scheme had been sanctioned, but that he, along with his expert, was to go into the question of the dredger with special reference to Messrs. Simons & Co.'s tender. He also stated that Sir John Biles, Consulting Naval Architect to the India Office, would, if the scheme were sanctioned prepare detailed specification and superintend the construction of the work. I replied that I had already discussed this part of the project with the Governor of Bombay, who, I understood, would be averse to any dual control in connection with the scheme, because if the dredger failed to do its work we (the Engineers) would naturally say that as we had nothing to do with the dredger we could accept no responsibility. I pointed out that this was not an ordinary dredging proposition, as there was nearly as much work on land as afloat, and that obviously the Engineers to the scheme must have a voice in the construction of the dredger, although Sir John Biles, as Naval Architect, might reasonably be expected to see that the dredger was a properly built, sea-going dredger, and capable of doing the work demanded of her. I said the last thing any of us wanted was friction, and that we were perfectly willing to work jointly and amicably with Sir John Biles, but that we must be given an opportunity of fully discussing and approving of the details." Up to now he is not saying anything

about the interview of the 16th April. It is dated the 16th, but up till now he is only talking about the 25th March?

A.—That is so.

Q.—" In a letter from the Director General of Stores dated 10th April Sir John Steevens remarked that the approval of the Secretary of State in Council had been given that all steps short of placing the contract were to be taken in the preparation of the necessary detail plans and specification, etc., for the provision of the dredger, pumping station, pipe-lines, etc., in anticipation of full approval of the execution of the scheme being given at a later date, and the Government of India had requested that the special consideration of experts should be given to the design (or description) and cost of dredger as put forward in my report, and reference had already been made to Sir John Biles, Naval Architect of the India Office, on the subject. The dredger with its pipe-line communication with the shore, and the pontoon for intermediate station, would come under the supervision of the Naval Architect." Then he is telling you all the past history. I do not see any record of anything that took place on the 16th April. This memorandum is dated the 16th April, but that is all.

A.—There is a copy of a letter from Sir John Steevens to Sir George Buchanan dated the 26th April, I do not know whether you have that. It is the next letter in the file.

Q.—Yes.

A.—If you will read that I think you will see the reference.

Q.—It is the letter of the 26th April from Sir John Steevens to Sir George Buchanan beginning: " At our interview of the 16th instant, at which Sir John Biles was present, regarding the provision of dredger, pontoon, pipe-lines, etc., for the Bombay Back Bay Reclamation Scheme, I intimated that approval had been given to proceed with the preparation of specification, etc., for the construction thereof. We also discussed your memorandum of that date on the subject of the defined responsibility for their construction and agreed to the points which you put forward therein. I beg to confirm the foregoing and understand that you are in communication with Sir John Biles." What was the arrangement arrived at at the interview of the 16th April?

A.—I think that is clear in Sir George Buchanan's memorandum.

Q.—We should be content to have it from you, I think.

A.—I think it is all included in that memorandum which you have just read.

Q.—Which memorandum?

A.—The one you read which begins: "At my interview with Sir John Steevens on the 25th March, he informed me " and so on.

Q.—Will you just put in your own words what was the respective responsibility that you had for the construction of the dredger and that Sir George Buchanan had?

A.—I took the letter of Messrs. Simons of the 12th September, 1919, as the basis of the plans and specifications of the dredger and carried through the construction of that dredger in accordance with that letter. I kept Sir George Buchanan fully informed, as requested by him, of all that was taking place. Copies of all drawings, copies of the specifications, etc., were sent to him for his approval or modification. Throughout the whole course of the building he had the plans which were approved of for the building of the ship. That was the procedure. I think I have stated that in my memorandum.

Q.—In the letter of 12th September, 1919, to which we will come in a moment, Messrs. Simons were giving the price, were they not?

A.—They were giving the price and an outline description.

Q.—Therefore they must have got out plans by that time?

A.—I suppose they did. I do not remember.

Q.—The firm would hardly bind themselves to a price unless they had worked out the plans.

A.—They might. They might think: " Well, it is so near a preceding ship that it is not necessary to make plans." I mean that is not at all uncommon in an offer to build a vessel. Obviously when they come to build they must make plans, but not necessarily when they are making tenders.

Q.—Have you had much experience of the particular type of vessel, the rotary cutter suction dredger?

A.—Yes, of the building of it, the construction. We have been doing that work for the India Office for 20 years off and on. The indents for dredgers come from India and they are passed through our hands for the procedure that I have oulined to you that took place in connection with the " Sir George Lloyd."

Q.—In the past 20 years about how many dredgers have passed through your hands in that way?

A.—Well, I should have to count them up.

Q.—Roughly?
A.—About a dozen perhaps.

Q.—Of the rotary suction type?
A.—No, not all, but most of them are of the rotary suction type.

Q.—Did the " Kalu " and " Jinga " pass through your hands?
A.—No.

Q.—They did not?
A.—They did not. They were built for the Port Trust Bombay, which orders direct. I am told it is eleven rotary cutters. We have counted that up from the tables, which shows that my guess was not very far off.

Q.—Have you seen a copy of the evidence given in Bombay?
A.—Well, I have seen it, but I am afraid it is almost too voluminous for me to say that I have read it all through, if that is what you want me to say.

Q.—I meant really in reference to those portions as to the actual work done by the dredger in Bombay?
A.—Yes, I have read that through.

Q.—On the 12th September, Messrs. Simons & Co. are writing to Sir George Buchanan. He had evidently, as we can see from the first line of the letter, sent them a letter on the 25th, because it says: " Referring to your esteemed communication of the 25th ".
A.—So I see.

Q.—Did you, when you read this letter with the enclosed specifications, consider it workmanlike?
A.—This letter?

Q.—Were this letter and the outlined specifications in your opinion workmanlike?
A.—This is the general description?

Q.—Yes.
A.—That is what you mean, beginning on page 20, headed: " 42-inch dredger "?

Q.—You got the outline specification on page 20?
A.—Quite, as far as it went.

Q.—Suppose a buyer wanted a dredger to cut soft clay, and indicated his wish that it should be a dredger to cut soft clay, would that dredger be different in its construction to one that another buyer ordered which was wanted to cut stiff and unctuous clay—would there be likely to be any difference in the specifications by the makers?
A.—You mean in the case of stiff and unctuous clay instead of soft?

Q.—Yes.
A.—Yes, I think there would; but " stiff and unctuous " is not a very definite term.

Q.—Neither is " soft "?
A.—No, that is quite true.

Q.—But the word " soft " indicates a different consistency to the word " stiff," does not it?
A.—Yes, I suppose you would say it is different. You want to know how you would give effect to that difference?

Q.—I would rather like to know that. I am putting you for the moment in the position of a dredger builder who has a customer wanting a dredger that will cut stiff clay—hard clay?
A.—Well, I do not think he would make any difference, except, perhaps, a little in the cutter. The result necessarily is that he could not get as much output from the stiff and unctuous clay, or he might consider that he would not get as much output as he would from a soft clay.

Q.—We have seen the dredger. We have been told that the engines driving the rotary cutter are 400 horse-power?
A.—Yes, more than 400.

Q.—More than 400 horse-power?
A.—Yes.

Q.—But they are said to be 400 horse-power. In point of fact it works at about 130 horse-power, and except for the last cut of about 18 inches, has not apparently had any difficulty in dealing with the material. Would 400 horse-power, in your opinion, be sufficient to cut clay of any description, soft or hard clay of any character?
A.—I should think you would want to reduce the cutter in diameter to cut very hard clay. I think the tendency would be in that direction. But if you had to make a machine which was to cut soft and hard, varying from soft to very, very hard, you want to get an average cutter, because you cannot change the cutter as you are going on with your work. So the dredger builders put a cutter in which has some relation

to the average conditions, probably sacrificing on the harder conditions in order to make good on the softer conditions.

Q.—On the harder there would be a certain slowing up of the cutter, in your view?
A.—Yes, or it might be stopped.

Q.—It might be so stiff as to actually stop the cutter?
A.—Yes, it may be so stiff. I think some of the witnesses have said that that hard clay was hard enough to stop the cutter.

Q.—I think not. I think you will find that the general concensus of the evidence is that there was no difficulty until they came down to stiff clay. I think I am right in saying that only one witness has ever spoken to the cutter being absolutely stopped, and that was in the case of coming on to moorum or rock?
A.—Yes.

Q.—I believe I am right in saying that there is no evidence that the cutter was ever pulled up by clay?
A.—Well, I may be wrong in that.

Q.—I think that is how it stands.
A.—I think Mr. Spiers said so.

Sir Frederick Hopkinson.—No witness has ever said it was pulled up by the clay, only the moorum or rock.
A.—We are dealing with such unprecise terms in " hard " and " soft ", that it is very difficult to come to any very definite conclusion.

Chairman.—As the result of this letter, and as the result of the decision by the Government of India, the order in fact was given about May, 1920?
A.—I think I gave you the date in my memorandum. The dredger was ordered on the 15th June, 1920.

Q.—And the " Colaba "?
A.—The " Colaba " was ordered on the 15th July, 1920.

Q.—Was there any test ever made of the " Colaba "?
A.—The " Colaba " was tested for water delivery. She has no cutter on board of her.

Q.—The " Colaba " is a mere booster, is she not?
A.—A booster, a floating pump.

Q.—That is to say, she receives material which is cut by the " Sir George Lloyd ", and is passed through the " Sir George Lloyd's " pipe line, and then gives it the additional energy to deposit it on the reclamation site?
A.—It is passed into the " Colaba's " pump, which forces it on through another pipe-line.

Q.—Was she ever tested for pumping power?
A.—Yes, on the Clyde she was tested for pumping water power. We could not get a pipe-line on the Clyde of anything like that length; and we pumped water through and tested the capability of the machine to pump up to its full power on the Clyde.

Q.—There was, in fact, no actual pumping of water and material through anything like 5,000 feet of the " Sir George Lloyd's " pipe-line?
A.—No, there was not. The line of pipe that she pumped through was about the length of the ship. She took it in at the fore end of the suction pipe, which was at the fore end of ship, and delivered it over the stern, something under 300 feet, including, of course, the pipe in that length.

Q.—So that under the actual daily working conditions, neither the " Sir George Lloyd " nor the " Colaba " ever underwent a test of the daily working conditions?
A.—Not until they got to Bombay, obviously they could not; we could not get 5,000 feet of pipe-line on the Clyde.

Q.—At all events they did not have it?
A.—They did not.

Q.—There was in the contract, as we know, no requirement that the makers should deliver the dredger and " Colaba " at Bombay, and there satisfy the purchasers that they could do the stipulated work?
A.—I do not think there was. I do not remember at the moment, but I do not think there was.

Q.—You may take it that there was not.
A.—I think that is so.

Q.—What I want to ask you as an expert is this. Would that be a usual condition to insert in a contract, that the dredger maker should bring the dredger and the booster 4,000 or 5,000 miles, and should give a test of its working capacity?
A.—No, that is not usual; it is usual to complete the delivery of the dredger on the Clyde.

Q.—And, indeed, in the plainest terms the document stated it so, did it not? It is the middle of page 18: "If ordered within three months of this date, we could have the dredger ready for trial on the Clyde in twelve months"?

A.—Yes.

Q.—That was a clear indication that Messrs. Simons and Co. were willing to construct the dredger according to the specification for trial on the Clyde?

A.—Yes, that is quite clear. Of course, that is not the contract. I wanted just to get the contract. I do not know whether you have got it.

Chairman.—I wanted to see the contract. I have not seen it.

Sir Frederick Hopkinson.—There is no contract.

Mr. Ewbank.—This is the nearest approach to the contract, I think. (*Document handed to the Chairman.*)

Chairman.—It is dated the 10th November, 1920. Is that what you mean when you refer to a contract?

A.—May I correct this? I can put it perhaps better in this way. I am not quite clear that it is so in this case, but our usual practice is to issue conditions of tender, which are made into a contract when the order is given, and in the conditions of tender are stated the matters to which you have made reference, with the conditions of trial, for instance.

Q.—Anyhow, the fact in this case appears to be as follows:—On the 10th November, 1920, Mr. W. F. West, Director-General of Stores——

A.—For the Director-General of Stores.

Q.—Yes—wrote a letter which says: "Dredger and plant for the Bombay Back Bay Reclamation scheme. Gentlemen,—In the letters from this office dated 15th June and 15th July, 1920, respectively, reference is made to the preparation of a formal contract in respect of the supply of the above-mentioned dredger and plant. Subject to your concurrence, it seems unnecessary that any more formal contract should be entered into at present than is already contained in this correspondence between us. If you agree: (1) That the contract is contained in the correspondence set out in the list enclosed and in the two specifications therein referred to (these for the purpose of identification might be signed on behalf of the parties); (2) That the terms and conditions contained in the last completed formal contract between your company and this office (that of the 24th June, 1919, for the supply of a self-propelling light draught cutter suction dredger, with floating pipe-line and terminal pontoon for the Pegu Sittang Canal) shall, *mutatis mutandis*, apply to this contract." So that the correspondence was assumed to contain all the material particulars?

A.—That is so.

Q.—Did it in your opinion in fact contain all the material particulars?

A.—I think so; but, of course, this is a matter for the legal people in the India Office.

Q.—I follow that.

A.—In my opinion that is a contract which was quite binding and clear.

Q.—Then the "Sir George Lloyd" and the "Colaba," having been put in hand by July, 1920, there came a time when you went to Glasgow for the trials?

A.—Yes.

Q.—The dredging trial of the "Sir George Lloyd," I think, took place on the 24th November, 1921?

A.—That is so.

Q.—You made a report?

A.—I did.

Q.—That report is to be found at page 31 of the correspondence with Messrs. Meik and Buchanan regarding the execution of the works. You say: "This dredger was built by Messrs. Simons and Company, Ltd., and bears their yard number, 650. She left Renfrew harbour at 8 a.m. on Monday, the 21st November, 1921." On that day was it a mere dredging test as apart from a speed trial?

A.—Yes; I think it was quite independent.

Q.—That is how it appears?

A.—Yes. I cannot remember that, and I must refer back to the figures.

Q.—At page 35, five days later, on the 26th November, 1921, you were engaged in speed trials?

A.—That is so. I have seen it now.

Q.—Was the contract speed eight knots?

A.—I suppose it was—that is so, eight knots.

Q.—On that day did she in fact do 7½ knots?

A.—Yes.

Q.—It is true, is not it, that she never did her eight knots until she had her bow sheathed in?

A.—I should like to look into that.

Q.—Please take your own time. At the bottom of page 35 you will see : " The bow well was plated in for the voyage and the cutter frame hove up and secured in place."

A.—I think I may say that is so.

Q.—So that when she was in the external form of a dredger she did 7½ knots, but when she had her bow well plated in she did in fact touch eight knots?

A.—Yes ; I suppose that is so. I have now our copy of the report, if I may refer to it.

Q.—Please do.

A.—On the final trial she got 8·23, and in addition to having the bow plated up she had her propellers changed.

Q.—But a dredger going from one point to another to work would not have her bow well plated up?

A.—No ; only for the voyage out.

Q.—Have you any doubt in your own mind that it was the plating up of the bow well which gave her just that little extra amount of speed?

A.—Well, I do not think anybody could say. It must have been the propellers, They would not have changed the propellers without their being of opinion that the propellers were not the best that could be fitted, so that I cannot tell you. I do not think there is much in plating up the bow myself.

Q.—Have you been present at a good many tests on the Clyde of rotary dredgers?

A.—Yes.

Q.—How many?

A.—Well, seven or eight, perhaps.

Q.—Were you completely and thoroughly satisfied as to the dredging and pumping capacity of the " Sir George Lloyd " ?

A.—Absolutely.

Q.—She was specified to pump 2,000 cubic yards an hour, and her pump to discharge that through 5,000 feet of pipe line.

A.—Yes.

Q.—With regard to the " Colaba," were you satisfied as to the " Colaba's" pumping capacity?

A.—Absolutely. It was the same as the " Sir George Lloyd."

Q.—The point has been noticed that the " Colaba " has self-propelling engines?

A.—Yes.

Q.—You remember that?

A.—I know. She had to be navigated out.

Q.—It is true she had to be navigated out, but when she got on site, all that was wanted was something in the nature of a pontoon?

A.—Well, it depends what you are going to do with such a plant. If you are going to move it about it is probable it is better for it to have its own self-propelling power. If it were used subsequent to the Bombay Back Bay scheme it might want to be in a place where it would have to get under way readily to get into shelter. There are advantages in having self-propelling boosters. Another point that I think has got to be made is this. The " Colaba " when she had finished the reclamation scheme might have been converted into a cutter dredger, and then it would have been very desirable for her to have self-propelling power.

Q.—Do you say that on the whole it was not unreasonable to incur the additional expense of self-propelling engines?

A.—Yes ; on the whole. The cost of taking the vessel out if she had been completed in this country would have been well on to the cost of the self-propelling engines.

Q.—Surely she would have been taken out in sections, would not she?

A.—Well, that would have cost a considerable amount. too We are constantly dealing with that question of what is the best thing to do. We frequently find that it is better to complete a vessel in this country and let her navigate her own way out there rather than have to complete her and tow her out, as the cost of towing is very considerable. The third alternative is to take the plant down as erected in this country and carry it in a steamer, re-erect it out there and float it. Each particular case has its own solution. I think in this case that it was not very far out to obtain the solution that was obtained.

Q.—Have you noticed that part of the evidence which deals with the vibration of the " Colaba "?

A.—Yes, I have

Q.—For some reason or other great difficulty has been experienced with the " Colaba " from almost the beginning due to vibration.

A.—So I understand—not from the very beginning.

Q.—I said almost from the beginning.

A.—Yes. She seems to have run free from vibration for some time, and then to have developed it.

Q.—In your view were the internal arrangements of the " Colaba " well designed as regards the balance?

A.—May I just explain a little?

Q.—Please do.

A.—The question you ask me is : were they well designed as regards the balance?

Q.—I will tell you why I ask that question. One of the witnesses said that in his belief there would have been little or no vibration if the pumping apparatus had been put amidships, in the centre of fore and aft displacement.

A.—Yes.

Q.—What do you say about that?

A.—Well, I do not think that would have made any difference. The vibration in any structure is not due to the structure; it is due to some vibrating cause outside the structure. The question whether the structure will respond to the vibrating cause and vibrate is, of course, dependent on the period of the structure's natural oscillation. In the case of the " Colaba " she was run on the Clyde, and no vibration was shown when she was pumping water through the pump There is no vibration in the case of the " Sir George Lloyd " when she is pumping spoil through the pump. The engines are exactly the same. The pump is exactly the same. The engine's seat is a little stronger in the case of the " Colaba," perhaps more by accident than anything else, than in the case of the " Sir George Lloyd." The only difference between the two vessels is that one is shorter. The " Colaba " is shorter than the " Sir George Lloyd " and therefore stiffer. Her period of vibration may be a little different, and so it may be with certain combinations of impulses from the pipe line that her structure responds to the vibratory cause that is in existence. The way to get over that is to change the period of the motion of the engines and run the speeds a little differently. I think the evidence shows when they did run the speeds either faster or slower, vibration was avoided. If you continue to run at a critical speed when the vibration is excessive you will disturb the structure in time, and something will have to be done to renew that structure. I think that is pretty much the condition of the " Colaba." What is the cause of the vibration I do not know. I do not think anybody has found out yet. If we knew that we could say something about why it has happened, and what kind of remedy could be suggested.

Q.—But vibration is always one of the matters which a manufacturer has got to guard against, is it not?

A.—Well, as a matter of fact, vibration is not generally found out until the vessel is completed. To that extent you cannot guard against it. You cannot find it out. This question of synchronism and disturbing causes and structural periodicity is not a simple problem.

Q.—What I really mean is this. The manufacturer recognises that there will be vibration, and must be vibration, on the vessel That is so, is not it?

A.—No ; I do not think that he knows. He hopes that there will not be.

Q.—But should he not, for instance, put his engines on a bed plate with such a thickness of bolts, and the bolts so close together, that he will not have the engine shaking off the bed plate no matter what the vibration?

A.—No ; I do not think that any builder would expect to connect an engine to a bed plate so that whatever the vibration was the bolts would not shake loose.

Q.—When I say " whatever the vibration " I mean, of course, the vibration during the working period.

A.—Yes. If the question was of normal ordinary vibration the bolts would hold it, but if you get an abnormal vibration the bolts will not hold it, and you must do something to remove the vibrating cause so that the vibration is not abnormal.

Q.—When the " Colaba " began to show damage from vibration were you consulted about the matter at all?

A.—Yes ; they told us what they proposed to do.

Q.—When you say " they," whom do you mean?

A.—I mean somebody in Bombay.I forget who it was, but somebody in the engineering department of the Development Directorate.

Q.—Did you agree with their proposal?

A.—No; I said that I thought they should find the vibrating cause and remove that, and the structure would be all right. I think that is a general principle that will be accepted.

Q.—But apparently on the " Colaba " the vibrating cause was the actual doing of the work for which she was intended.

A.—Now we open up the question: was she intended to do the work she is doing—she was to cut soft clay.

Q.—Not cut, but pump?

A.—Pump soft clay.

Q.—She is intended to pump soft clay?

A.—She could not pump it without cutting it, could she?

Q.—I am speaking of the " Colaba "?

A.—Yes, she was intended to pump soft clay.

Q.—The " Colaba " was only intended to pump whatever material came from the " Sir George Lloyd "?

A.—Soft clay.

Q.—Is it your suggestion that possibly she had to exert undue power to pump the material that in fact was delivered to her?

A.—No. I do not think he had to exert more power. I do not know what was the cause. I do not wish to convey that what I say now is any positive opinion on my part, but it is possible that the loading which has come on to the " Colaba " through the pipe-line has been of an intermittent nature; and sometimes it is heavy stuff that lies in the bottom of the pipe and sometimes it comes through as fairly free-flowing material, and there is a variation in the load that goes through the pipe which may cause the engine to race and cause vibration. That is just something that may be a possible cause. The real cause may be very different from that but nobody seems able to determine what the exact cause is.

Q.—This was a reclamation on a very large scale?

A.—Yes.

Q.—Larger than any reclamation hitherto attempted?

A.—I do not know. I do not know relatively about other reclamations.

Q.—Do you know of any other reclamation in any other part of the world in which it was proposed to reclaim 1,143 acres on an open sea front?

A.—I do not know. I am not familiar with these matters. I am told that Sewri was as big as this. But I do not know that. I am not a contractor or a dredger worker.

Q.—As an expert in these matters what is the first essential of a reclamation dredging scheme of this character?

A.—Well, now, I am not an expert in these matters. I am a Naval Architect who can build a dredger or take care of the building of a dredger, but I am not an expert in matters of reclamation, which are Civil Engineers' work.

Q.—I will put it to you in this way. As a Naval Architect in a reclamation scheme of this character, which would you be sure about first—the provision of a dredger or the existence of material suitable in quantity and quality for your dredger?

A.—There again it is a Civil Engineer's job to find out what is the thing with which the dredger has to deal.

Q.—Obviously.

A.—The Civil Engineer tells me what the dredger has to do and then I try to produce something that will do it.

Q.—The first thing is to be sure that you have got the material sufficient in quantity and quality, is not it?

A.—Well, I am not any judge of that. You will decide that, I have no doubt. That did not come into my purview at all. If you ask me as an ordinary citizen, well, that is another matter, but not as an expert.

Q.—I will ask you as an ordinary citizen. As an ordinary citizen, is not the first essential before you spend £650,000 pounds on a dredging plant to make sure that you have got material suitable in quantity and quality?

A.—Well, I should have thought so, and I should have thought that it was done in this case, but my opinion on that is not worth anything.

Q.—Have you noticed the results of the work of the " Sir George Lloyd "? She began on 8th December, 1923. The " Sir George Lloyd," the " Colaba " and the other craft and the pipe-lines cost very little less than a million pounds, did they not?

A.—I believe they did cost something like that.

Q.—Arriving in March, 1922, and not being utilised until 8th December, 1923, there was a loss of nearly £75,000 in interest, was there not?

A.—I accept your statement on that.

Q.—It is a matter of calculation?

A.—Yes.

Q.—Was there any reason why when the "Sir George Lloyd" was put to work on the 8th December, 1923, she should not have given her proper output?

A.—I do not know.

Q.—I am speaking generally.

A.—I know that one thing was she went ashore in getting into position.

Q.—She touched ground but she did not do herself any harm?

A.—I do not know what may have happened between the time she went out and the time she got to work.

Q.—I will tell you the point I want to make. It has been suggested that the very poor results of the first season's working, which was from the 8th December to some time in May was because the work was experimental. That has been the reason suggested. I ask you, if you take a dredger and go and moor her over a dredgable bed, is there anything experimental about the matter at all?

A.—Well, if you have got a trained crew ready to do the work, I should think not. Of course you have got to find out what the bed is like.

Q.—Exactly!

A.—I mean you find it out by dredging.

Q.—Or do you find it out by previous borings?

A.—Well, that is another method, but what I mean is you will inevitably find it out by dredging, and to that extent your dredging is experimental.

Q.—There is no difficulty, is there, in ascertaining exactly of what the bed of the sea consists in a sheltered place with an average depth of 30 feet of water?

A.—There, again, I must ask you not to treat me as an expert in that subject. The only thing I know about the bed of the sea is when you drop a lead line and find out what the depth of the water is, and you then get up something which is really the surface of the bed. I know nothing about it.

Q.—Do you know nothing about core drilling?

A.—No.

Q.—Do you know generally that by care and diligence it is quite easy to ascertain what the bed of the sea consists of when you are dealing with the bed of a sea 30 to 40 feet deep?

A.—No, I do not. I should think it ought to be easy, but I do not know.

Q.—I will now ask you a question which I am quite sure you can answer. Given a proper face—by which I mean a proper depth of dredgable material—is there anything whatever experimental in a rotary suction dredger coming up to the face and starting her work?

A.—No, I should not think so.

Q.—If you get a suffifficient depth of material of the right consistency and you get a crew who know their job you get the result?

A.—Yes, certainly; and if you do not, you do not get the result.

Q.—Will you turn to page 3 of Sir Lawless Hepper's Report? You see that Sir Lawless Hepper gives the results for 1923, 1924-25 and 1925-26. The dredging season of 1923 began, as I have told you, on 8th December. The dredging seasons of the other years began somewhat earlier. In 1923-24 the "Sir George Lloyd" pumped 1,020 cubic yards per pumping hour. That is a disappointing result?

A.—Yes.

Q.—In 1924-25 she pumped 856 cubic yards only?

A.—Yes.

Q.—And in 1925-26 she pumped 959 cubic yards?

A.—Yes.

Q.—Have you any theory to account for it?

A.—I can only take the statements of your witnesses almost wholly when they say that the pumping plant is all right and the material is all wrong. That is about what it amounts to

Sir M. Visvesvaraya.—I will ask you a few fundamental questions to begin with. It is stated that there were certain unusual features in the ordering of the dredger?

A.—I do not know what you mean.

Q.—I am only mentioning them for the moment. One is that hard clay is met with in the harbour and that the specification for the dredger referred only to soft clay. A second is that tenders were invited from more than one firm, but there is no record that they were examined when received, and that Messrs. Simons & Co.'s tender was preferred for any specific reasons?

A.—Do you want me to deal with that?

Q.—I will mention these features first, and we will go into other details afterwards. The third feature is that, although the dredger was a very important plant, the tests were confined to the Clyde; no provision was made for tests being carried out at site. Those are chiefly the allegations made. I only want to know what the truth is in each case. You are aware that the dredger is not giving the promised output?

A.—Yes.

Q.—It has only been giving hitherto between 25 per cent. and 40 per cent. of the promised output per season?

A.—I do not know the percentages. I only know these figures here.

Q.—You may take it from me that it is between 25 and 40 per cent. If that is the percentage, the dredger has failed to come up to expectations, has it not?

A.—The expectations have not been realised.

Sir M. Visvesvaraya.—You admit that?

Chairman.—I do not think Sir John admits that the dredger has failed, but the dredging operations, which is rather a different thing. The failure of the dredger is one thing and the failure of the dredging operations is another which we must keep very distinct?

A.—I quite agree.

Sir M. Visvesvaraya.—Cannot you say the dredger has failed if it does not give the promised output—for any reason; it may be because the site was bad, or the soil was bad, or anything else?

A.—Let me put an extreme case to you. Supposing the dredger had been at anchor the whole time and had done nothing, and the promised output had not been given. Would you say the dredger had failed? It had never been tried. The dredging operations may fail; the results may not have come up to expectations, but that the dredger has failed is not at all demonstrable.

Q.—But it is a doubtful point, anyway, whether it is due to outside circumstances or whether it is due to the inherent defects in the dredger?

A.—No, not in my opinion. It is not doubtful in my opinion. I am certain the dredger is all right. Do not think I am admitting that there is anything wrong with the dredger.

Q.—You only say that in the working there is something wrong?

A.—I know the results have not been realised. That is all I really know.

Q.—You are aware that she has worked three seasons?

A.—There are records for three seasons here.

Q.—In three seasons it has not been able to give the required output. After all, the essential thing is that we should get the required output, and it has failed to give that output—or, rather, the combination of working and the machine have failed to give the output?

A.—The output has not been given by the machine. That is right.

Q.—What do you think are the causes for that, from what has been put before you?

A.—I have already said to the Chairman that I only know of what your witnesses have said—that the dredger is all right but the material is all wrong. That is substantially what it amounts to.

Q.—When you designed the dredger did you get all the particulars which were needed about the material in which it had to work?

A.—None whatever.

Q.—Why was that?

A.—The dredger I was told to design was described in the letter of Messrs. Simons, and I went ahead and did it.

Q.—Messrs. Simons are manufacturers?

A.—They are.

Q.—You take your instructions from Government, do you not? It is all given there in that letter?

A. Yes, quite so. Messrs. Simons are very experienced manufacturers in dredging. There are very few people who would pit their opinion against Messrs. Simons on matters of dredger building. I merely mention that in case you are not familiar with their standing over here.

Q.—The plant was designed to deal with five million cubic yards per annum?

A.—Yes.

Q.—Working 170 days, doing 15 hours actual pumping per day?

A.—Yes.

Q.—In two shifts. You will find it mentioned in the report?

A.—Yes, I am quite familiar with that statement now.

Q.—If the dredger was expected to do 15 hours actual pumping, would you expect that she would deliver the 2,000 cubic yards which were promised in the specification?

A.—I do not quite follow—if she had to work 15 hours a day?

Q.—2,000 cubic yards is the amount specified. Would they get, during the whole of those 15 hours, a uniform rate or an average rate of 2,000 cubic yards?

A.—I do not expect anything about it. I know that the vessel can do 2,000 cubic yards per hour.

Q.—But not for 15 hours regularly?

A.—That is a matter of organisation. That is not construction at all, and I was not responsible for organisation.

Q.—If the dredger is designed to give 2,000 cubic yards per hour, will it give for 15 hours an average of 2,000 cubic yards, or more than that?

A.—The machine is quite capable of doing that if your organisation is sufficiently ample to carry it through.

Q.—What is the usual practice? If a machine is capable of giving 2,000 cubic yards, what would she give in 15 hours, roughly?

A.—If you do all your changing outside the 15 hours (which, of course, is not always practicable) you can get 30,000 cubic yards, but for whatever time you have to stop when you are not pumping you lose that amount, except that the dredger in soft clay, and things like that, would be able to do more than 2,000 cubic yards, and so she might, on an average, for 15 hours do an average of 2,000 cubic yards; but I cannot say. The circumstances are so varied in dredging that it is impossible to dogmatise as to what would happen.

Q.—It is estimated that 30,000 cubic yards or so of material can be dredged for 170 days per season; if you multiply 170 by 30,000 it gives a little over five million cubic yards or tons. Would that be a right calculation to make generally in dredging operations?

A.—I am not an operating dredger man. You are the people who have to judge whether that is so. I cannot help you. That is my position.

Q.—When you design a dredger do you not take into account all the collateral circumstances and then see whether your machine fits into the position or not?

A.—If you ask me to design a dredger, and to demonstrate on the Clyde that that dredger will turn out so many cubic yards per hour, I can do it; but if you ask me to say that the dredger will continuously, for periods of years, turn out 2,000 cubic yards per hour, then I say I do not know. I do not know the circumstances under which the dredger will work. I am no authority on such a question.

Q.—But your duties are defined by the Director-General of Stores in these words: "The duties of the firm include the preparation of designs and specifications, examination and recommendation of tenders, inspection during construction and approval on completion"?

A.—I know.

Q.—When a dredger has to be designed for Indian conditions, do you not make an inquiry into the local conditions before you prepare the designs?

A.—No.

Q.—Did you read Sir George Buchanan's report before you prepared the design?

A.—I looked through it. I cannot remember what I did about it. The only thing that guided me was the outline specification supplied by Messrs. Simons.

Q.—In a scheme of this sort, if any mistakes are made it is a serious matter. Do you not go into all these extraneous details before you make up your mind?

A.—I cannot undertake to keep other people from making mistakes.

Q.—But Sir George Buchanan has mentioned in his report the existence of "Hard clay in places". Did you notice that point?

A.—I believe the words "hard clay" are mentioned once in the report.

Q.—And also in these estimates he refers to hard clay.

A.—It is not inside the outline specification. I understand you are going to have the builders.

Chairman.—Yes. I think you will get from them what happened about the question of clay between Sir George Buchanan and themselves

A.—I do not know. It is no use asking me about that. My knowledge of the subject begins with their letter of the 12th September. Before that I knew nothing. I do not know whether that meets your point.

Sir M. Visvesvaraya.—I thought that all the collateral circumstances would have been taken into consideration by you before you prepared your design. After all, the people who write to you are not experts; they are your clients. They merely represent to you "These are the local conditions. You are the expert. Now go and design for us."

It is for you to dig out all the details from them, and then see whether or not your machine is adapted to the circumstances, is it not? I only want full information. I do not want to criticise you.

A.—Please do not hesitate to criticise me if you think I am wrong. The conditions under which the work has to be carried out are laid down by some civil engineer who has local knowledge. He then says: "I want a dredger to cut certain material". Then we have to produce that dredger to cut that material. If he says: "I want a dredger to cut soft clay," and afterwards that dredger will not cut rock, I do not think you can say that we have failed in our duty in producing a dredger which will not cut rock.

Q.—I think you mentioned, in answer to a question by the Chairman, that it is very difficult to distinguish between soft clay and hard clay; there is no demarcation line between them?

A.—I did not quite say that.

Q.—Would it not be safe to design your dredger to cut hard clay as well?

A.—Oh, no. It altogether depends on the amount of the hard clay: If it is all hard clay, of course you would design the dredger to cut hard clay; but I was not asked to design a dredger to cut hard clay. I was asked to design a dredger to cut soft clay.

Q. But did not you ask the engineers "How is it in your report you mention hard clay"?

A.—No. I did not.

Q.—You went by the letter of their instructions?

A.—I went by the outline specification.

Q.—But I think the India Office asked you to work out this in consultation with Sir George Buchanan?

A.—No, I do not know that they asked that. What they said was: "Arrange what you are to do between you." I was to look after the construction of the dredger, and he was to have the opportunity of seeing whether the dredger that we were producing was what he wanted.

Q.—But there are no watertight compartments in this matter. It is all the one business of both of you, is it not?

A.—Sir George Buchanan was in his office, and I was in mine.

Q.—This is a £650,000 contract, and all the circumstances have to be taken into consideration. Do you not feel you have a responsibility in the matter of recommending this dredger without getting all the particulars of the site, especially when you knew that in his report he mentioned hard clay?

A.—What you want me to say is that I should take care that Sir George Buchanan knew his business and did it properly. Is that it?

Q.—I think so, to some extent.

A.—That is not my function, and I would not accept any such responsibility. I could not.

Q.—I see your point.

A.—I may be wrong, but that is my position.

Q.—When you design a dredger do you not insist that careful studies and tests of materials should be made on the spot, and that there should be delivered to you the results of those tests?

A.—You mean when the dredger is finished?

Q.—No, when the dredger is to be designed.

A.—What do you mean by "careful tests"?

Q.—The quality of the material.

A.—You mean that they should give me exact information as to what the material is?

Q.—Yes, and samples of the material as well.

A.—No, that is not my responsibility.

Q.—You do not get samples of material?

A.—Sometimes we do, but I cannot say that the sample which is given to me is the stuff which the dredger is going to cut. All I can say is that that is the sample which is given to me.

Chairman.—The last question put to you was with regard to samples of material—whether it is customary to send samples of material; that is to say, suppose there is a reclamation scheme in West Africa or in the southern part of South America, would you expect to receive, or would it be a prudent and sensible thing for the people there to send you samples of material and say: "This is the sort of stuff that the dredger will have to deal with"?

A.—Sometimes they do and sometimes they do not.

Q.—Is it not a great help to you to receive such information, and also to the dredger-makers?

A.—I do not know that it is a very great help. If you say that the material is very hard clay or that it is silt, then the dredger builder has a very wide range between those two. I do not know whether words can describe the difference as well as the material itself which is sent, but I am not sure that it is a great help to the dredger builder.

Sir M. Visvesvaraya.—In this case soft clay has been specified, although hard clay is met with. Hard clay was known to exist on the spot when the subject came up to you. Hard clay is also mentioned in Sir George Buchanan's report. How is it that such an important point was overlooked by you? Did the conditions of the soil come to your notice at all, other than the soft clay?

A.—No. You say it was overlooked by me?

Q.—You have seen that mentioned in Sir George Buchanan's report.

A.—Yes, since this inquiry began I have seen it.

Q.—Not before?

A.—Not before—not that I remember.

Q.—Do you not think you are taking too narrow a view of your responsibilities?

A.—That is for you to judge. That is the view I take of my responsibilities.

Q.—You designed the dredger along with Sir George Buchanan, and the manufacturers undertook to build it. If the dredger has failed to give the promised output, who is responsible for the failure? Somebody must be responsible, must they not, in a matter of an affair of a million pounds?

A.—Again, I must say that it is your function, and not mine, to say who is responsible. My view is that I am responsible for the construction of the dredger and to see that it shall fulfil the requirements that are laid down in Sir George Buchanan's report. That is my view of my function. You may take some other view.

Q.—I understand both of you were asked by Government to consult with each other and to produce a specification which would answer what was wanted? You say you have merely taken literally what Sir George Buchanan laid before you, and confined your specification and instructions to that?

A.—That is what I did.

Q.—Did you give the dredger makers a notice of tender; that is, did you give them instructions to prepare their designs and specifications? In notifying the tender, did you give them notes as to what they should base their tender upon?

A.—We gave them plans and specifications upon which they were to tender, and those specifications are an elaboration of the outline specification which is in that report.

Q.—Did you send such instructions to several builders, or only to one?

A.—Only to one.

Q.—I understood tenders were invited from a number of builders?

A.—Not by me.

Q.—That is a very important point. You had no hand in notifying tenders?

A.—Yes, in notifying the tender from Messrs. Simons—one tender.

Q.—You were not asked to invite tenders from anybody else?

A.—No.

Q.—How is it that Messrs. Lobnitz and Company have also tendered?

A.—I cannot tell you.

Q.—There is a tender received from them?

A.—I gather from Sir Lawless Hepper's evidence that other tenders had been received.

Q.—And you took no notice of them?

A.—I did not receive them.

Q.—They were not placed before you?

A.—I never saw them. I never heard of them until I saw about them in that evidence.

Q.—Was it after a dredger-builder had been appointed by the Secretary of State that the matter came up to you?

A.—I do not think the dredger-builder was appointed in that sense. The instructions were to get a tender from Messrs. Simons, and that tender was accepted. Then they became the builders for that particular dredger. No one else was asked by the Director of Stores that I know of—only Messrs. Simons.

Q.—You know of no reason why the other dredger-builders were excluded?

A.—I cannot give you any direct evidence. I have heard, but I do not know. Other witnesses will probably give you that; I do not know.

Q.—Why were no guarantees stipulated in the specifications to ensure that the dredger gave the required output at the site of the work? Why did not you hold the

manufacturers responsible for putting the dredger in a serviceable condition on the site of the work?

A.—Firstly, it is not usual. Secondly, I do not believe the builders would have undertaken such a responsibility.

Q.—Not even if you had offered them some more money?

A.—I do not believe they would have undertaken the responsibility and if they had done so it would have been at a considerable increase in price. I must ask you to let me rely on the first, which is our usual practice. We see the dredger working on the Clyde under conditions which are the same for each dredger. When they pass those conditions we then consider the dredger has fulfilled its contract so far as its building is concerned.

Q.—I understand that in this country they do arrange for tests at site. For instance, at Aberdeen, they had recently ordered a vessel, and they do admit of such conditions?

A.—I do not know.

Q.—Do you know that in Bombay harbour itself the " Kalu " and the " Jinga " were tested at site, and that payment was made to the manufacturers after the tests were satisfactorily carried out?

A.—I understand they were.

Q.—Knowing that this was even a bigger proposition than the " Kalu " and " Jinga," why did not you advise some extra payment in order to have the tests carried out in the harbour?

A.—I have already told you.

Q.—Was not there some risk in not doing that? Especially because this is probably the biggest-sized dredger you have handled. That being so, would it not have been well to have taken the additional precautions, even at some additional cost?

A.—No. There is no additional risk in this type of dredger as compared with the " Kalu " and the " Jinga." The fact that the " Kalu " and the " Jinga " have fulfilled their contracts on the site is some justification for believing that the " Sir George Lloyd " would do the same—that the dredger would do its work. Mind you, the " Kalu " and the " Jinga " worked on one site; the " Sir George Lloyd " worked on another.

Sir Frederick Hopkinson.—But the same harbour?

A.—Exactly, but with very different conditions, I understand. Well, I do not know. I saw the " Kalu " and the " Jinga " working in Bombay at Sewri, and I should have thought the stuff they were cutting was soft clay. Anyhow, the dredger was designed to cut soft clay.

Sir M. Visvesvaraya.—You take your stand on that point—that the dredger was designed to cut soft clay?

A.—Yes, of course.

Q.—Knowing that the " Kalu " and " Jinga " were tested at site, why did you not advise the same thing being done in the case of this dredger also?

A.—I told you that it is our usual practice not to do it. Look at what would have happened in that case. You say, " We will test it on the site." You had the ships lying doing nothing for 21 months. What is going to happen while you are putting them to their test. Are the people going to wait all that time for their money?

Q.—They could have said, " If the test is not carried out within six months, we are not responsible."

A.—Then that proviso would not have been any use to you.

Q.—They might have separated a small block. They might have arranged the pumps for you?

A.—That may be. We did not do it; that is all, and that was our practice. I think the practice came about, in the first instance, because we found very often, that when plants were sent out complaints were made about them, and nobody could tell who was to blame. So we said, " We will, at any ate, show that the dredgers can do their work in this country, and when they have done their work in this country, if they cannot do their work out there, it is because the conditions are different; either the crews are not competent, or the ground is different."

Q.—In such cases you have to make reasonably sure that your dredger will do its promised work?

A.—That is our way of making reasonably sure.

Q.—Why were the precautions, which were taken in connection with another set of dredgers, not taken in the present case?

A.—I have already told you.

Q.—Is dredging an established scientific process or not? Are you sure of your results in dredging or not?

A.—You are sure of what a dredger can do under specified conditions.

Q.—Is it not very necessary to be particular about the specification of the conditions, and to have enquiries made about the conditions?

A.—It is no use to specify that a dredger shall always work at its maximum efficiency. It is no use to make that a condition. All you can say is that, under specified conditions, the dredger shall do its work as specified. Then the other conditions must follow as circumstances happen.

Q.—Was the additional cost involved a consideration in omitting that provision?

A.—Yes, of course. I am sure we should have had to pay more for it.

Q.—You can always get manufacturers to guarantee the output at the site of the works if they are offered the necessary extra payment?

A.—I do not know. You say " always ".

Q.—In most cases?

A.—You can always ask them.

Q.—If they get the money they will do it?

A.—You can always ask them. It is for them to decide.

Q.—If they will not do it, somebody else will?

A.—The field of selection in this case was not very wide. We were told to go to Simons.

Q.—That is one of the reasons why you say you had to confine yourself to the specifications given?

A.—I do not quite follow.

Q.—There was only one manufacturer, so you could not bind him down too strictly?

A.—I say that our field of selection was very limited. You said you could ask somebody else. In this particular case you could not.

Q.—With regard to the tests on the Clyde, it is said that the bottom of the Clyde is soft clay and silt; that the material is often churned about and moved over and over again. It must be extremely soft, must it not? It does not represent the natural conditions of a soft clay bed, does it?

A.—Yes. It is soft clay. It represents the condition of soft clay, in my opinion.

Q.—It has been so often stirred up?

A.—No, it is not like that. It is not one hole. It is not as if you took a hole and stirred the stuff up and dropped it in again, and then stirred it up again and dropped it in again. There is a large area over which you can dredge.

Q.—But so many experiments are made there, that very often it is worked up over and over again at the bottom?

A.—No. We have made 11 suction dredgers in 20 years. That is not a very large number in 20 years. There is not a very great number of dredgers built on the Clyde.

Q.—So you think the bottom is as good as a natural bottom?

A.—Absolutely. It is an absolutely fair test of the material which is there; and the material is not stirred up as you suggest. It is just what happens to come down at the bottom of the river. If you cut a hole once, you do not go and dig that hole again. Besides that, one sees the stuff that comes up. It comes up on the cutter, and you can see it.

Q.—The " Sir George Lloyd " had to pump through 5,000 feet of pipe line. Your test was only from one end of the ship to the other—a short length of pipe—was it not?

A.—That is so.

Q.—How could a test of that character indicate work under natural conditions?

A.—I explained that in my memorandum.

Q.—They say the test was not under normal working conditions. What have you to say?

A.—You ask me how it could represent normal conditions.

Q.—Yes, working conditions?

A.—I explained in my memorandum that we cut 3,700 square yards per hour of that material and threw it overboard—pumped it out. That shows that the cutter can cut an ample amount of that material. The question whether it can pump it through a pipe line can only be demonstrated in one of two ways. You can make a calculation based on certain assumptions, or you can put it through the pipe line itself. We could not put it through the pipe line on the Clyde, so what we did was to estimate the amount of power, or head, necessary to force it through a pipe line, and we estimated that the power which the engines have is more than ample to pump it through the pipe line. That is all we can do.

Q.—The conditions in the pipe line at site are very varying. There would be leaks and air cushions formed. Your tests make no allowance for all such obstacles?

A.—The pumping through 5,000 feet of pipe line will not be affected by leaks in the pipe. The air will not get in through that pipe line.

Q.—It does get in?

A.—It is under pressure all the time.

Q.—It is a floating pipe?

A.—Yes, and you are forcing stuff through it.

Q.—Would not there be additional friction for all these reasons?

A.—That is all allowed for.

Q.—Anyhow, it is a theoretical assumption, after all?

A.—You can call it what you like.

Q.—It is not testing under normal working conditions?

A.—It is not testing through a pipe line, I know that. I should very much rather test it through a pipe line, but you cannot get a pipe line on the Clyde.

Q.—They say the dredger cannot cut the clay properly—that the dredger is too weak to cut this hard clay?

A.—I do not know. It is no use asking me that.

Q.—Assuming that it is so, can you not improve the working by increasing the horse-power of the engine, or by increasing the propelling power of the cutter?

A.—As I said just now, you may possibly increase the cutting power of the cutter for hard clay by reducing its diameter. You will then make it less effective for all the rest of the work it has to do.

Q.—It will not be a balanced machine?

A.—No.

Q.—Are you in favour of the dredger working three shifts? That is outside your purview, is it?

A.—I do not know.

Q.—Are you concerned with the engineering side at all?

A.—The civil engineering side?

Q.—Are you concerned with the building side or the engineering side?

A.—I am a naval architect concerned with the building of a dredger.

Q.—Its capacity also included, I suppose?

A.—Its capacity included, obviously.

Q.—When was the report made that the dredger did not come up to expectations?

A.—I cannot tell you that. I suppose that was made in Bombay, was it not?

Q.—Was any reference made to you about it?

A.—The first intimation I had was at the beginning of this year.

Q.—You had heard something about how and why the dredger was not giving satisfaction?

A.—No, I had heard nothing. I was in Bombay in November, 1923, and in April, 1924. They had not begun in 1923. In 1924 I did not know what was happening.

Q.—But did they not make any report to you that the dredger was not working satisfactorily, and seek your advice?

A.—Not until January of this year.

Q.—Have you replied to that?

A.—Yes.

Q.—Have you given your advice as to what action should be taken?

A.—We did.

Q.—May I ask if you could produce that letter, or state briefly what you said on that occasion?

A.—With regard to the "Sir George Lloyd," there was nothing to say. With reference to the "Colaba," what we said was that we thought that the oscillation in the pipe line might perhaps be controlled by opening the sea valve to let water in when the pump was not getting water through the bottom line. They said they had tried that and that the effect was that material went out through that sea valve, and they did not think that was satisfactory.

Chairman.—They said it took two men twenty minutes to do it.

Sir Frederick Hopkinson.—And they ran the risk of sinking the ship.

Witness.—Which is slightly inaccurate.

Chairman.—They were not enthusiastic about it when we saw the boat at Bombay.

Witness.—You have all this here. It is printed. I am only trusting to my memory now. We suggested that perhaps it would be desirable to actuate this valve for letting the water in by a valve which was connected with the vacuum in the pipe. We suggested a machine which would do it. They wrote back and said the effect was so momentary, and the vacuum was so small, that they did not expect they would be able to get any control on that valve for that purpose, and there the matter ended. That is as far as we have gone, but it is quite impossible for me at this distance, knowing so little as I do of the circumstances that are connected with it, to prescribe a remedy. Somebody on the spot can do it with a fuller knowledge. That, I think, is an answer to your question.

Sir Frederick Hopkinson.—But nobody on the spot has your scientific knowledge?

A.—That may be; I do not know. There ought to be. I am ignorant about a good many things.

Sir M. Visvesvaraya.—You are very modest. When a machine which you have built has failed, is it not your business to call for all the information, and to study the case properly, and to see how it can be put right?

A.—I should like to, but I cannot do everything in the world. I have other things to do.

Sir M. Visvesvaraya.—May I ask who wrote to you about this in January last?

Chairman.—That correspondence related to the "Colaba."

Sir M. Visvesvaraya.—I did not know that.

Chairman.—It does not relate to the "Sir George Lloyd," but to the "Colaba"?

Witness.—I started by saying there was no complaint about the "Sir George Lloyd."

Sir M. Visvesvaraya.—Yes, you said so.

Witness.—The Chief Engineer of the Reclamation Branch wrote to me.

Chairman.—That would be Mr. Elgee at that time.

Sir M. Visvesvaraya.—Nobody brought it to your notice that the "Sir George Lloyd" was not giving the required output?

A.—I think they did that at the same time.

Q.—They did not ask you for any remedy in that connection?

A.—I do not think they did; I cannot say, but you can see from the document.

Q.—When the dredger failed to give the promised output, whom should the Government have consulted in order to rectify the complaint?

A.—I suppose they should have referred the matter to the Director of Stores, and ask my opinion on it.

Q.—But they have not done that on this occasion?

A.—I say, yes. At that time they called attention to the fact that the dredger was not giving its output.

Q.—You did not call upon the builders to put it right?

A.—No. You see the vessel was finished in early 1922—four years ago.

Chairman.—If I may interpose for a moment, the difficulty arises in the form of the question. Sir John does not suggest that there was anything to put right in the "Sir George Lloyd." He says the "Sir George Lloyd" is a thoroughly efficient machine. (*To the Witness.*) That is your point?

A.—Yes, that it is.

Sir M. Visvesvaraya: But you have since been informed that the material to cut is not soft clay, but hard clay?

A.—Yes, I suppose I have been.

Q.—Have your thought of any remedy?

A.—I have not been informed officially of that. The only think I know about it what has come out in the evidence in this enquiry.

Q.—Is it not rather unusual that the machine should have been working unsatisfactorily for two or three years and that you were not kept informed?

A.—I do not know. I do not think I can answer that question. I do not get too much information from India about the working of these machines; in fact, we have had to write to various places and ask them to be good enough to tell us how the machines were getting on. If they are getting on all right we do not hear anything, but we do like to know what their output is.

Q.—When a machine does not put forward what is expected of it, is it not usual for the principals to write to you and keep you informed, and, through you, to communicate with the dredger makers and ask them to put matters right?

A.—Yes. If there is something about the machine which is wrong and which can be put right, the builders put it right.

Q.—But the principals only knew that it did not produce the required output and did not make good what was promised. The Government only knew that the plant was not giving satisfaction, and it was for the experts to advise what should be done to put it right. However, you have not been approached in the matter?

A.—I am not an expert to advise them as to what has to be done—as to getting material. My point is that the dredger is a satisfactory dredger for the purpose for which it was designed, which was to cut soft clay. If you are cutting hard clay, and you are cutting murum, and you do not get the output, all I can suggest to you is that if you cannot cut that stuff you had better get another dredger and double your output.

Q.—You cannot improve the present dredger?

A.—No, not cutting that stuff.

Q.—Then if the material there was hard clay, and you got information that it was soft clay, whose fault was it?

A.—That is for you to judge—if there was any fault.

Q.—You do not think there was any fault?

A.—I give no opinion.

Q.—You are non-committal?

A.—It is not my function.

Q.—Then is the problem to be given up as hopeless, with so many advisers and engineers?

A.—I have offered you one solution, and I have no doubt you will get a great many others. If the dredger, on account of the material, is only able to produce half the output which was expected, then one way of getting the whole of the output is to double the dredging plant. That is one way; I do not say it is the only way.

Q.—That is true, but it means doubling the cost?

A.—No, it only means double the cost of the dredger, and it does not mean even that at present prices.

Q.—Anyhow, you have not been approached for a solution and they have not reported to you how things were getting on?

A.—No.

Q.—That is a very important point?

A.—Do not please say they have not told me anything about it. You will find that has happened in the correspondence.

Q.—Someone has to be held responsible out of the three parties—the engineers, the naval architect, and the builders. Whom are we to hold responsible in this case to improve the working of the dredger. May I ask what is the usual practice?

A.—The dredger is not capable of improvement. I have already stated that the dredger is doing its work perfectly well—the work for which it was intended. If you wanted to cut hard clay, and you find it is only doing half its output, it is doing as much as it can do. If you want to double your output and make it 2,000, you must double your dredging plant. At least that is one way to do it.

Q.—Anyhow, the fact remains that the dredger does not give the required output?

A.—That is so.

Q.—You only give us the technical explanation that you were informed that it had to cut only soft clay, and you do not suggest how to remedy the position now?

A.—I have made a suggestion; I do not know that it is the best one. Your own witnesses say that the dredger is working well, and that the reason that it is not giving the desired output is that the material is not the right material. If you are bound to those conditions, then you have to submit to one-half of the output which you want, unless you get another machine which will give you the other half.

Q.—Whatever may be the reason, whether it is due to insufficient information or data, a mistake has been made and we have to rectify it. Do not you consider it your duty to advise on the point?

A.—I have advised. I offer you that advice.

Q.—It is a very poor consolation for us to know that we have to go in for another dredger?

A.—There may be other ways. I have not given this matter much consideration; I did not think it was my duty. You asked me, and I might go into the thing more fully. There are other ways than that.

Q.—You have no remedy to suggest now, except that one?

A.—I say that is a possible remedy. I do not say that I recommend you to do that. I have not given the matter enough consideration.

(Adjourned for a short time.)

Sir M. Visvesvaraya.—The design is usually furnished by the builders, is not it?

A.—Not in my experience; but I think perhaps what you say is correct. Generally the shipbuilder makes a design and makes an offer on that.

Q.—You check the design and satisfy yourself that it is in order?

A.—We check it. We went over it. We made out a new set of plans which were very much like the former plans of similar ships, and we made a specification. A detailed specification would include a great many things that were not in the outline specification, and that are necessary to be put into the construction of such a ship.

Q.—You do not mind my asking you what was the fee you were paid for the work?

A.—Well, I do not know whether I am under an obligation to answer that question.

Q.—It is well-known. It is given in the correspondence. I only wanted to see what your view was.

A.—It is one per cent. on the cost.

Q.—One per cent. on the cost of——?

A.—Whatever the sum was.

Q.—Are you not required to keep in touch with the working of the machine and satisfy yourself that what you designed was a success?

A.—Not for that fee, that I know of. We do, as a matter of fact, try and find out what the machines do for our own experience.

Q.—After the builders are asked to give a design they give a design, and then the other conditions have to be attended to by the consulting engineers of the principal. Your duties then must be exceedingly light. Tell me if that is not so, taking a sense of proportion in these matters?

A.—Well, " light " is a very indefinite term.

Q.—You know the materials from the specification and the conditions are given by the engineers, so that what remains can be done by you perhaps in two or three days' time, from your experience?

A.—Certainly not, I have to see the construction through the whole of its stages.

Q.—They do the work, and you only test it at the end of the time?

A.—No; we see it through while it is being done, and see that it is being done satisfactorily. We review all the drawings to see that the structure is being made in what we think is the best way.

Q.—But the consulting engineers also do that sort of work, do they not? They claim that they have gone through all the detailed plans?

A.—For the dredger?

Q.—Yes?

A.—Well, I do not really know what they claim; but I think I know that Sir George Buchanan had two per cent. for the work.

Q.—He had one per cent. The two per cent. was divided between you and him?

A.—That is right

Chairman.—Generally two per cent., but in respect of this particular transaction you divided the percentage?

A.—That is it, so that Sir George Buchanan had one per cent. and we had one per cent. Now it was not necessary for both of us to do the same work.

Sir M. Visvesvaraya.—But one would be a check on the other?

A.—Absolutely.

Q.—They have not kept you in touch with what is going on about the working of the dredger? You have not thought it necessary to call for the information?

A.—Well, they have not kept me in touch. I suppose if I had asked I should have got some information. I do not think they would have refused it.

Sir Frederick Hopkinson.—Who actually designed this dredging plant?

A.—Do you mean in all its details?

Q.—In all its details?

A.—Well, the drawings were made, in the first place, by us.

Q.—The original drawings?

A.—The general arrangements. Then when the work began the builders made out their working drawings which we see in their works while they are being made, and copies are sent to us to our office to be reviewed in our office by our staff in relation to the former work that has been done.

Q.—That is the actual detailed working drawing?

A.—Yes; we see every one of these all through.

Q.—But the general arrangements you are originally solely responsible for?

A.—Well, I cannot say we are originally solely responsible.

Q.—That is what I want to get at. Who is responsible?
A.—I am responsible, but you said " solely responsible."

Q.—You are the marine architect in charge of the construction of the dredging plant?
A.—That is so.

Q.—As such you are, I assume, solely and entirely responsible?
A.—Well, there I do not quite agree, because the builders have responsibility.

Q.—Only for carrying out your designs and instructions?
A.—Well, if you look at their contract you will see that they have got to make the thing work notwithstanding any omissions in the specification.

Q.—Yes?
A.—They cannot get off their responsibility by saying that I am entirely responsible. I think that is so.

Q.—I quite follow you? Did you design the engines?
A.—No; they were designed under our superintendence.

Q.—But makers like people who build these dredgers have got stock drawings of these sort of engines, have not they?
A.—Yes.

Q.—And the pumps?
A.—Yes.

Q.—Did you design the cutter?
A.—No, not in the sense that you say. They drew up the cutter and we supervised it.

Q.—You passed it?
A.—We passed it—that is what it is.

Q.—There must be some sort of relation between the cutter and the work it has to do.
A.—Yes.

Q.—Because quite obviously if the cutter does not cut the clay the pump cannot pump it.
A.—Obviously.

Q.—Would you design the same kind of cutter for soft clay as for hard clay?
A.—Well I suppose not. It is difficult to answer that in terms of "soft" and " hard " is it not?

Q.—Would you call soft clay on the Clyde anything like that piece of clay there. I should like you to examine that piece very carefully. (*Piece of clay handed to the Witness.*) Look at the broken face and feel the weight of it?
A.—Yes.

Q.—It has a pretty high specific gravity, has not it?
A.—Yes. I suppose it has.

Q.—Would you call that soft clay?
A.—It might have been soft clay.

Q.—When?
A.—When it was cut.

Q.—You think it might have been?
A.—It might have been. I think I could show you clay from cuttings on the Clyde which are almost like that.

Q.—You would not describe that as hard clay?
A.—I do not think so. I do not know. I should like to see it wet.

Q.—I have seen it wet and I certainly should not call it soft clay.
A.—You would not?

Q.—Most certainly not.
A.—I would sooner see it wet, and then describe it.

Q.—You have not seen it wet when you were out there in May, 1924?
A.—No, I never saw any kind of cutting. The only time I have seen Bombay material that was clay, was in the Sewri Dock.

Q.—The Sewri Reclamation?
A.—Yes. I think that was about 1907 or something like that.

Q.—It was 1908. Can you tell me how the description " soft clay " ever got into the specification?
A.—I do know, but I would rather not because I am only told by somebody else.

Chairman.—You can tell us by whom.

A.—I have been told by the builders how it came in, and they will probably tell you how it came in.

Chairman : We shall see the builders.

Sir Frederick Hopkinson : Sir George Buchanan in his original report described it as hard clay.

A.—Did he?

Q.—He did, not once but several times.

A.—Yes?

Q.—He presumably would see it when it was wet?

A.—You are making that statement I suppose?

Q.—Before he described it?

A.—Yes.

Q.—A man of Sir George Buchanan's experience would not describe something he had not seen.

A.—Well, I do not know.

Q.—Will you agree with me that it is an essential factor in designing a dredger to know what it has to do?

A.—Certainly.

Q.—That is why I want to know how we get the definition of soft clay. Did you see any sample of it?

A.—No.

Q.—Then what were you designing on?

A.—On what was in that letter.

Q.—On the term soft clay?.

A.—On the term soft clay.

Q.—Do not you think you ought to have made some investigation to know what you were designing this large and expensive dredger for. Do not you think you ought to have had a sample?

A.—Well, I do not know. I did not. That is all I can say.

Q.—I put it to you in this way. A dredger has been designed for Bombay which has so far proved a failure?

A.—I beg your pardon.

Q.—To dredge clay at Bombay?

A.—That may be so.

Q.—That is why it has proved a failure.

A.—You see it has not dredged the clay, as I understand it, that it was originally intended to dredge.

Q.—To dredge clay in Bombay.

A.—It was originally intended, as I understand it, to dredge it on the R.I.M. ground.

Q.—In the Harbour. There is no change of site of the dredger.

A.—Well, I think they changed it to Back Bay.

Q.—We are not dealing with Back Bay. The " Sir George Lloyd " never went into Back Bay.

A.—I did not know that.

Chairman : The " Sir George Lloyd " never dredged in Back Bay at all. The " Sir George Lloyd " invariably dredged in the Harbour.

A.—Did she dredge where she was originally intended to dredge?

Chairman : Yes. I will show you where she dredged. (*The position was explained on the plan to the witness.*)

Sir Frederick Hopkinson : In area G where there is no clay the " Sir George Lloyd " has dredged : in area K where there is no clay at all : in area J where there are about three parts of mud to clay : in area H where there are about 4 parts of mud to 3 of clay. So that practically they have done very little clay dredging. It has been very largely mud.

A.—Is this all what they have lifted out?

Q.—No, this is what there is to be lifted out. These are Sir George Buchanan's figures sent out to Bombay as the dredging programme.

A.—I see. Is this piece of clay a sample of the dredging?

Q.—That is a piece of clay which has been dredged by the " Sir George Lloyd."

A.—That is the clay they say is too hard?

Q.—They say in one case it is excellent material and better than they expected—that is for reclamation purposes. Then the Director of Developments says it is too hard, but I take it that that is the clay that the cutter was designed to cut?

A.—The cutter was designed to cut soft clay.

Q.—Then I will put it in another way—that the dredger ought to have been designed to cut?

A.—Well, that may be so.

Q.—This actual material?

A.—Yes?

Q.—I am going to suggest to you that to the general public and to the world we have got a position here in which a dredger and dredging plant at a cost of £850,000 has been supplied to do certain work. It seems to me that unless there is some adequate reason for it, a certain stigma attaches to anyone who has had anything whatever to do with the designs or construction of that dredger?

A.—That is your opinion?

Q.—I put it to you?

A.—Well, I shall not admit that.

Q.—You would not?

A.—No I shall not admit that a stigma attaches to anyone.

Q.—Not to the Engineer in charge of the work or the designer of the dredger?

A.—Well ——

Chairman.—Do you mean to someone or do you mean to everyone?

Sir Frederick Hopkinson.—To anyone who has had anything to do with the design of the thing.

Chairman.—Even though there was not enough material?

Sir Frederick Hopkinson.—It is not a question of there being not enough material. It is a question of being able to dredge this particular material. I suggest to Sir John that he ought to have had samples so that he would know what he was designing his dredger to do. You have apparently designed a dredger to do something other than the work to be done in Bombay?

A.—Other than work that has been done in Bombay.

Q.—To be done, because Sir George Buchanan describes it as hard clay. He is the Engineer who is responsible for giving you instructions?

A.—Yes, I suppose so.

Q.—You carry out his instructions?

A.—Yes.

Q.—If I may say so without offence, somewhat blindly—you did not have a sample of clay?

A.—I did not interfere with his instructions at all.

Q.—What I suggest is that you ought to have had a sample?

A.—What do you mean by I ought to have had it?

Q.—You ought to have had a sample.

A.—He ought to have given me a sample?

Q.—Certainly, you ought to have asked for it?

A.—I had instructions.

Q.—You were designing a dredger to do a certain thing. You did not know what it was going to do. You have simply made a note that it is soft clay?

A.—Yes.

Q.—Would not a competent designer say : " Let me have a sample of this so that I may know what I am going to do "?

A.—No; I should be content to take the definition of " soft clay " as usually interpretated such as a dredger builder would understand to be the nature of soft clay.

Q.—I must take your answer. You would be satisfied to take what somebody tells you, notwithstanding, as Sir George Buchanan has said, and probably told you, as he tells everybody, that this was the biggest dredging proposition of modern times?

A.—I was interested in producing a dredger to instructions given to me.

Q.—A dredger to do something?

A.—To do something.

Q.—Which it has not done?

A.—I beg your pardon.

Q.—Which it is incapable of doing?

A.—Which it has done, excuse me, according to the instructions which were given to me.

Q.—You do not get away from the fact that we are dealing with this clay at Bombay. This dredger was designed to dredge clay in Bombay?

A.—Yes.

Q.—It has not done that, and apparently it is incapable of doing it?

A.—It was designed to dredge soft clay, which I was instructed was the material that had to be dredged in Bombay. If it turns out that it was not soft clay then some other action must be taken about it.

Q.—What I am suggesting is this: that as a prudent man you ought to have had samples and decided for yourself as a dredger-designing expert what your dredger had to do.

A.—Well, that is your suggestion.

Q.—Do not you think so?

A.—No; I do not think so. I do not think I can go any further than I have gone. I was instructed to design a dredger which was to cut soft clay. The dredger will cut soft clay.

Q.—I say that this clay in Bombay is not soft clay.

A.—I was not told that.

Chairman.—The position is this. Sir John says: "I had certain information given to me. I was told to design a dredger to cut soft clay, and I did it." That is your view?

A.—That is my position.

Q.—"I do not think that it was a necessary part of my duty to require specimens of clay to be sent from Bombay"?

A.—That is so. You see, Sir George Buchanan came back with full knowledge of what was there. But the builders had made dredgers which had cut in Bombay a large quantity of material, and I think that I was justified in relying on Sir George Buchanan and the builders to know the kind of cutter that would be required for that material.

Sir Frederick Hopkinson.—What I was suggesting to you is that Sir George Buchanan himself described the clay as hard, and yet the builders' specification calls it soft.

A.—That may be. I do not know how that is.

Q.—You speak about the other dredgers dredging the Sewri. Do you know that neither of these dredged 2,000 yards an hour?

A.—I am afraid that is not correct.

Q.—I have the official figures.

A.—Of course, I do not know, but I ask you to take the builders' statement on that because the builders' statement has some relation to the inference in the matter.

Chairman.—It is said that the "Kalu" did 406 cubic yards an hour at her best.

Sir Frederick Hopkinson.—I do not think that is true. The "Kalu" did an average of 1,400 cubic yards an hour, and the "Jinga" did under 1,000.

A.—Is not it the other way round?

Q.—You are quite right. The "Jinga" was the better of the two, although they are identical.

A.—I have heard there is a difference which is attributed to the management.

Q.—I am told in order to get over that difficulty they changed the crews over, but it did not make any difference. The "Jinga" dredged an average of 1,426 cubic yards an hour.

A.—She was designed to do 1,500.

Q.—She was designed to do 2,000.

A.—1,500, I think.

Q.—2,000.

A.—I am told she was designed to do 1,500.

Q.—It is 2,000. This is the official paper given to us. This is from the Port Trust: "The dredgers 'Jinga' and 'Kalu' were built in 1908 by Messrs William Simons & Company, Limited, Renfrew. They were designed to be capable of dredging 2,000 cubic yards of soft clay and mud per hour from a depth of 30 feet and, discharging the material so dredged a distance of 4,500 feet on shore."

A.—My information is it was 1,500.

Q.—This is information given by the Port Trust, the owners of the boats.

A.—Mine comes from the builders.

Q.—If we are wrong the builders will, no doubt, correct us; but that is the information given to us.

A.—39-inch pump against 42 in this case.

Q.—But only 30 feet dredging depth subsequently increased to 40 feet; whereas the " Sir George Lloyd " is 70 feet.

A.—Well, I may be misinformed about that.

Q.—All this information was available to Sir George Buchanan. He knew the Sewri reclamation had been done, and he could have passed this information on to you. Did he do so?

A.—No.

Q.—Would it be possible to run that cutter faster than 12 revolutions a minute? Would it be practicable?

A.—The cutter was run on trial 107 to 121 revolutions—the engines were run at that.

Q.—I am speaking of the cutter. You know about it. You designed it. What is the cutter designed to run?

A.—I cannot remember it.

Q.—It is geared down.

A.—I take it from you that it is.

Q.—That is what we were told out there. I cannot tell you from my own knowledge.

A.—Suppose we take it at that, this cutter can run at 160 revolutions as against, say, 114 on an average; therefore, you could increase the number of revolutions of that cutter in the proportion of 160 to 114.

Chairman.—You get it running about 16 a minute, under those conditions.

A.—That is about it.

Sir Frederick Hopkinson.—The point in my mind is this. Would you authorise the running of that cutter at 16 revolutions a minute? Would it be safe?

A.—I should like to look at the design again.

Q.—I should be very glad if you would let me know, because it is one possible way out of the difficulty as it exists to-day. If the cutter can run at 16 revolutions it will, obviously, be able to give much more for the pump to do?

A.—Yes; if she can cut the stuff at these revolutions.

Q.—I should be much obliged if you would look into this, because it is rather important to the Bombay Government for the future.

A.—Certainly.

Q.—I am not sufficient of an expert to say run it faster, but if they could get an opinion from you I am sure they would be very grateful for it.

A.—Yes; I do not think there is any doubt about running the engines faster. My doubt is, and I do not know without looking, whether the present cutter would stand that.

Q.—That is what I want you to tell me.

A.—But if it would not stand it I should think it is quite likely another one could be made to be put on.

Q.—Would not that be a partial solution of the poor output of the dredger if you could cut more? Are you satisfied that the pumps can pump 2,000 yards an hour?

A.—Quite.

Q.—If you can cut it, will not that be a possible solution?

A.—Yes.

Q.—At any rate, a partial solution?

A.—Yes; if you can cut it—if you can cut the quantity increased in proportion to that increase.

Q.—You have no doubt of the pump being able to discharge it?

A.—Not the slightest.

Q.—You spoke, in answer to the Chairman, about the average rate of cut, but at any rate, whatever the clay is, as long as it is clay it must cut at the rate of 2,000 yards an hour, must it not?

A.—It must be cut at the rate of 2,000 yards an hour.

Q.—In order to get 2,000 yards an hour through the pump?

A.—Yes.

Q.—It is purely a question of cutting, as far as the clay is concerned.

A.—That is what I said in my memorandum. We cut 3,700 cubic yards an hour.

Q.—We are coming to the quality of the clay. Why did you, in your report of trials, call it black clayey silt?

A.—That is the description, I suppose, that covers what is looks like.

Q.—But that is not a description of clay.

A.—But it is a clay really. I think that description of it got in from the output of the water pipe, because it flings it about in small particles and makes you feel it is a flakey silt.

Q.—You cannot turn clay into silt.

A.—You can powder the clay.

Q.—But then it is not silt.

A.—Perhaps it is not a good description. I know what the material is, but whether the description is right is another thing.

Q.—Flakey, clayey silt you have not necessarily got to cut—it will run.

A.—But they do cut it. It comes up in flakes—thick flakes.

Q.—Could you see them, because your discharge pipe was below the water line, was it not?

A.—No; above the water line. You can see them when the cutter stops. It is on the cutter.

Q.—You can?

A.—Absolutely.

Q.—It has been suggested that all the dredgers built on the Clyde have been tried at or near this particular place, and that all that stuff has been turned over and over again.

A.—No; I do not think so.

Q.—What area is there for trying the dredgers there?

A.—Quite a considerable area. Do you know the Clyde?

Q.—Very slightly, and not down there.

A.—It is along that shore, between Craigendoran and Helensburgh. It is the same stuff throughout.

Q.—All the dredgers built on the Clyde have been tried there?

A.—I cannot say all of them, because some of them are not tried.

Q.—Most of them? All that are tried are tried there?

A.—All that are tried are tried there when they are tried for soft clay.

Q.—The whole success of this dredger lies in that definition of clay. If your cutter had been sufficiently good to cut through 2,000 yards of hard clay an hour, we should not have had this trouble?

A.—I admit that.

Q.—To come to the question of cutting, should the dredger throw 2,000 yards an hour?

A.—I should think so.

Q.—Up to the present we have not realised an average of half that?

A.—No.

Q.—That is a very important thing?

A.—I understand the importance of that.

Q.—The dredger was designed and intended to do 5,000,000 cubic yards a year?

A.—Yes.

Q.—Dredging for 170 days, 15 hours a day. We were told in Bombay that the percentage of necessary stoppages from actual time work and reducing it to pumping time was 36 per cent. Several witnesses have told us that they did not consider that unreasonable. Have you sufficient knowledge of actual dredging to say whether you think it is reasonable or not?

A.—I do not know.

Q.—That is what we have been told?

A.—Yes?

Q.—Consequently, under no circumstances could this dredger have done 5,000,000 yards a year unless she had actually worked for 15 hours a day for 170 days a year?

A.—Yes, unless she had thrown more than 2,000 yards per hour.

Q.—One never hoped for that.

A.—Well, I do not know. All dredgers when they are tried throw out a great deal more.

Q—We generally find that builders' trials are far better than we can ever get afterwards?

A.—Very likely.

Q.—I do not know whether that has been your experience?

A.—Sometimes. Sometimes it is not. A builders' trial is under selected and chosen conditions and they make the contract on that.

Q.—It is like speed trials?
A.—Yes.
Q.—Where you pick your coal and pick your men and do anything else in order to get a satisfactory trial?
A.—Yes, and they generally give more than they contract for.
Q.—Sometimes they do. The " Colaba " was never tried at all?
A.—Well, I do not know what you mean by tried. She was tried with pumping engines, and she ran with pumping engines pumping water.
Q.—But no head at all, just passing water through. You would not call that a trial?
A.—These are the pressures. You have got the " Colaba " trial, have you not?
Q.—We have never seen them. I did not know she had been tried. I have never seen any tests of the " Colaba."
A.—The following readings were taken during the full power endurance pumping trial which lasted 4 hours. The vacuum is given at $5\frac{1}{4}$ inches, and the pump discharge in lbs. per square inch 33 lbs. that is 72 feet of head.
Q.—How was the delivery choked on the " Colaba "?
A.—I do not think it was choked.
Q.—How was it then?
A.—I beg your pardon, it must have been in order to try to reproduce a head corresponding to the pipe-line discharge. The pipe was partially closed and a bend was fitted through the bow inlet.
Q.—Is that the " Colaba " or the " Sir George Lloyd "?
A.—That is the " Colaba."
Q.—We have never seen these. Where did these come from?
A.—Well, I do not know how you got the others. I do not think we supplied them.
Q.—You must have done. You are responsible for them. They are your trials. They must have come from you.
A.—That is originally, but may I ask who sent you the copies?
Q.—We got them in a printed volume. I should like to see those, because we have never seen them?
A.—Certainly.
Q.—That does away with some of my questions. I thought the " Colaba " had never been tried.
A.—That is why I questioned what you meant by tried. You will notice the head there. That was 76 feet, and the vacuum was $5\frac{1}{4}$ inches, so that we had a head of 82 feet.
Q.—Why did you not put a vertical pipe behind the " Lloyd " in order to try her in working conditions?
A.—How high?
Q.—The necessary height of 80 feet?
A.—5,000 feet long?
Q.—It is not necessary to do it for 5,000 feet. That is horizontal. I am speaking of the vertical pipe?
A.—Well, I do not know.
Q.—There is no difficulty in doing it in a place like the Clyde. You have floating cranes there which would lift 80 feet high?
A.—You could not do it in the river.
Q.—Not where your dredger was tried?
A.—You might have done it there.
Q.—That is what I mean.
A.—You would have to go down the river with this pipe in place 80 feet up.
Q.—Could not you lift it up when you got it there?
A.—Not very easily.
Q.—I should have thought it could have been done?
A—.What purpose would that serve?
Q.—It would reproduce your actual working conditions.
A.—We got a pressure head
Q.—You did not with the dredging. That is only with water.
A.—You mean we ought to have thrown it. We ought to have pumped the stuff 80 feet up.
Q.—Yes, for a proper test. This is not a little 12 inch dredger, this a dredging plant costing between three-quarters and a million of money.
A.—I know.

Q.—Therefore its dredging tests were of the very greatest importance.

A.—I do not think it would have made any difference to the result, because I think you know pretty accurately what the resistance of the pipe is.

Q.—At any rate the " Colaba " was never tested with anything but water?

A.—That is all.

Q.—It struck me when I was out there that the " Colaba " need not have been a self-propelling pontoon at all, but an ordinary pontoon as Messrs. Simons originally quoted for?

A.—Electrical?

Q.—It does not matter whether it is electrical or steam. That would have been very much cheaper than a sea-going ship, surely?

A.—Well, I do not know how much.

Q.—Surely it would have been very much cheaper?

A.—Not very much.

Q.—You only want a square pontoon which you would make out there?

A.—It would not be very much cheaper.

Q.—Probably the engines of the " Colaba " are only used twice a year, one day to put her into position, and one day to get her back again?

A.—Yes.

Q.—Do not you think that is an unnecessary expense?

A.—You have got to go into the cost, the whole cost of navigating the ship out there.

Q.—You do not want to navigate her. You build the pontoon out there?

A.—It is the cost of navigating the ship under her own steam against the cost of sending out the material, the engines and the plates and re-erecting them out there.

Q.—I should think it would be very much cheaper to re-erect it out there?

A.—I do not know. I cannot tell you right off, but I do not think there is very much in it.

Q.—I have no hesitation in saying it would have been a very, very great saving?

A.—Well, you can investigate that. I doubt very much whether there is very much in it.

Q.—To come back to the vibration on the " Colaba," the Engineer of the Royal Indian Marine, I think his rank is that of Commander, who has examined the " Colaba," told us that when the " Colaba " was working her funnels were working fore and aft like that, moving as much as 6 inches?

A.—Did he measure it?

Q.—Yes?

A.—How did he measure it?

Q.—I do not know?

A.—It is very difficult to measure at the top of funnels, is not it, with the ship steaming?

Q.—You and I would be able to tell pretty closely. I understand she was not steaming but she was anchored?

A.—She was steaming with the funnels.

Q.—She was anchored?

A.—I know, but her funnels were hot and her boilers were hot and she was steaming.

Q.—She was raising steam?

A.—She was pumping.

Q.—I think you or I could tell, even by looking at it, whether it was 6 inches or 8 inches, could we not? I feel sure I could at any rate?

A.—I do not know how far apart are the funnels.

Q.—Not very far. Six inches is an extraordinary amount, is it not? You would call that a very excessive vibration?

A.—No, I do not think I would.

Q.—You would not?

A.—This vibration question is a question of oscillation of a structure which is more or less rigid at the base.

Q.—No, if it had been more or less rigid at the base these rivets would not have come out. There must have been oscillation at the base?

A.—The base of the funnel?

Q.—No, in the bottom of the ship? That is where the rivets came out?

A.—I do not admit that follows—the funnel is standing on a more or less rigid base, that is to say it is not very rigid and it is free to oscillate if you give it an oscillating force—a vibratory force

Q.—Would you not think 6 inches is quite abnormal?

A.—No, I do not know that I should. The ship did not open up so that the funnels came 6 inches.

Q.—I do not suppose they would?

A.—It is the funnel that is oscillating.

Q.—I know, but on the base?

A.—On the base, which is a very thin place—where the funnel is.

Q.—But it is sufficient for many hundreds of rivets to work loose?

A.—Yes, if it is long continued.

Q.—It was not long continued. They took it in fairly good time. In fact, the engineer said in his opinion it would have been dangerous to have continued its working for many days longer?

A.—Many days?

Q.—Yes?

A.—You would soon shake the rivets if you had a vibrating engine for a day, even.

Q.—He said it would be dangerous to work the ship.

A.—Because the rivets had got so slack—that is what you mean?

Q.—Yes?

A.—If it had continued they should have taken steps to prevent the vibration.

Q.—They did not know what to do, and evidently you cannot tell them what to do?

A.—I do not know what it is.

Q.—If anyone should know, surely you ought to know?

A.—I do not agree, because I do not know what took place out there.

Q.—They pumped half their proper quantity. That is what took place?

A.—They pumped half their proper quantity, but did they pump at half speed, or what?

Q.—That I cannot tell you.

A.—You cannot tell me what is the cause of it? They were pumping hard all that time, and they were getting half the quantity, so that all the water that is going through there was all right. The stuff that came, which is half of the 2,000, possibly may have come along in waves, as they expressed it.

Q.—If it came along in waves there is no reason why it should come along suddenly. If you can get it at one minute you should be able to get it at another minute?

A.—You get it choked where the cutter is, and suddenly that is released and it suddenly comes along in a gulp, and that kind of thing.

Q.—There is nothing in Bombay making that abnormal?

A.—It depends on the material that you are cutting. You would not get that in soft clay.

Q.—Well then, that goes to prove that it is hard clay?

A.—There is no doubt about that.

Q.—You said just now you would call that soft clay. You would not call it hard clay?

A.—That stuff?

Q.—Yes.

A.—But there seems to be something in the clay which prevents it from coming at the rate of 2,000.

Q.—Or it may be something in the cutter which will not do it.

A.—The cutter did cut the stuff.

Q.—Not this clay?

A.—It cut what I call soft clay.

Q.—Not this clay?

A.—What the builders intended to cut as soft clay.

Q.—They ought to have known what it was, because they have built the " Jinga " and the " Kalu."

A.—They have cut stuff out there.

Q.—At certain speeds. No doubt they have the official records of what the boats do.

A.—The builders say they have cut an average of 2,700 cubic yards for three weeks when they were running the plant themselves. We got that from them—2,700 in the " Kalu " on the Sewri scheme.

Q.—In that case surely it would have paid the Port Trust to have the builders out there to run the dredgers for them?

A.—It may be so.

Q.—Instead of one running at 926 yards an hour?

A.—I should think it would be so, but did they pay anybody to make it worth their while?

Q.—That I cannot tell you.

A.—Did they have a system of working which was sufficiently good to make the men produce the quantity?

Q.—They had a dredging master recommended by Messrs. Simons, Mr. Spiers. Do you know him?

A.—Yes.

Q.—He is a man of wide experience?

A.—Yes.

Q.—He came here the other day, and he struck me as being a very useful sort of man.

A.—I have seen him.

Q.—You know him?

A.—Yes.

Q.—Are you satisfied with him as a dredging master?

A.—I should have to see him work. I have not seen him at work.

Q.—He was a man recommended by Simons?

A.—Yes.

Q.—Presumably the best they could get, it being the biggest dredger they had ever made?

A.—It may be that Messrs. Simons do not take enough trouble to develop these men. I am somewhat of that opinion, that it is a very important job. I do not think you can say that that man, Mr. Spiers, was a highly intelligent man who should be put in charge of a job of that sort.

Q.—It all depends. He is not a scientific man, and he is not an educated man, but I should say he is a very competent man at his job. A man in that position requires supervision?

A.—Yes, he does. My own feeling about it is that this kind of work has become so important that it is worth while for a different class of man to take it up. I have spoken to the builders about it, and they said they were developing them, but the War came and cut off all their supplies of men. They would have men for doing this kind of thing, but the War has stopped it.

Q.—You told the Chairman that you knew nothing about the method for getting samples of clay. There is nothing easier, is there?

A.—I should think not.

Q.—On this particular site in 1912 they took over 1,300 borings showing the nature of the material?

A.—Yes.

Q.—That ought to have been ample, ought not it?

A.—I should think so.

Q.—You could not complain that for a comparatively small area like that they did not take enough borings?

A.—No; I should think not. When I answered the Chairman I did not know—I meant, from my own personal experience I have never taken any borings in the harbour.

Q.—It is a very simple matter?

A.—I quite agree.

Q.—If you cannot take a boring you can take a grab and get it in that way, or you can take a bucket dredger and get a bucketful or so. There is no difficulty about it?

A.—No.

Q.—In a matter of spending a million of money on plant, the expense of sending a bucket dredger to work there for a week would be infinitesimal comparing the total cost with the value of the information you would get?

A.—Absolutely.

Q.—There is nothing experimental about this work at all?

A.—Well, I do not know. I am not a dredger expert, you know.

Q.—If you have built eleven suction dredgers, do not you think you ought to be?

A.—Well, do you think that I have investigated all the places that have been cut by these dredgers?

Q.—You take an interest in your children?

A.—I take an interest in them, and I get occasionally to know about them, and what they do.

Q.—You would not be able to take advantage of experience if you did not know what was going on?

A.—No, I should not.

Q.—You said just now that everybody was agreed that the plant was all right but the material was all wrong?

R.—That is what I said.

Q.—The material has not changed since this dredger was ordered?

A.—No, it is only the name of it that has changed.

Q.—No, that is not changed even.

A.—Well, it has since it was ordered.

Q.—It has not.

A.—Because it was ordered to cut soft clay.

Q.—But the material itself has not changed.

A.—I said the name of it.

Q.—Nor has the name of it changed. It was hard clay in September, 1919, and it is hard clay to-day.

A.—When it was ordered it was ordered to cut soft clay. Now you say it turns out that it ought to cut hard clay. I say the name has changed.

Q.—You cannot give me an answer to the question who changed its name from hard to soft?

A.—I do not know.

Q.—Perhaps we will get somebody who can tell us.

A.—I think you will get somebody who will tell you the story.

Q.—You only sent the specification for the price to one firm?

A.—Yes.

Q.—That is Simons?

A.—Yes.

Q.—Do you not think that is an extraordinary occurrence?

A.—It is rather unusual.

Q.—I want you to go further than "unusual" and say that it is extraordinary that you should go to one builder only for a dredging plant costing nearly a million for the Government.

A.—I say it is unusual.

Q.—You would not go so far as to say it is extraordinary?

A.—No.

Chairman.—Extraordinary means something out of the usual.

A.—It is not common practice.

Sir Frederick Hopkinson.—As adviser to a commercial firm would you ever advise them to do it?

A.—Yes, sometimes.

Q.—You would?

A.—For special reasons.

Q.—Although a very large sum like that was involved?

A.—Yes.

Q.—And remembering that you have dredger builders quite as good as Simons?

A.—I am not disputing that.

Q.—Would you not, if you were advising a commercial firm, say: "Get tenders from all the best firms you knew of and could recommend"?

A.—Certainly.

Q.—You would?

A.—Yes, unless I were ordered to the contrary.

Q.—You do not know why this was not done?

A.—Well, as far as I am concerned, I was told to take tenders only from Simons. I think that is in Sir George Buchanan's report.

Q.—No, he said prices were asked from three other firms?

A.—Yes, but that was before, I understood—before it came to me.

Q.—You see he took the price from Simons on the 12th September, 1919?

A.—Well, I do not know, but I guess from what was said by Sir Lawless Hepper that about that time he also booked in tenders from other people. That is all I can say.

Q.—There are three paragraphs in Sir George Buchanan's report. One said that he invited three from other people. One said that they could not tender, and another said they wanted a lot of information about it before they could tender, and one sent a

cable. Now that looks as if Sir George Buchanan must have been in Bombay when that was sent, otherwise why should they send a cable. This third firm quoted £840,000 for two complete dredgers, each of 2,000 cubic yards capacity. I do not know whether that is two dredgers and two boosters, each of which would do 2,000 yards and 10,000 feet?

A.—I do not know. I do not know anything about that. What is that report you are quoting from?

Q.—This is the report from Mackie, from the Government Department.

A.—I am only asking that because I want to refresh my memory as to whether I could have seen that before.

Q.—This is dated 26th February, 1920. That was after you had designed the dredger.

A.—No, 16th April was my first active connection with it.

Q.—1920?

A.—Yes.

Q.—But the dredger was actually ordered in May, 1920?

A.—15th June.

Q.—Did you do the whole thing in two months?

A.—Yes.

Q.—Who accepted the tender?

A.—I suppose the Director-General of Stores. That is the usual form.

Q.—Were you asked to advise on the tender?

A.—Yes.

Q.—Did you advise that it was a reasonable and proper tender?

A.—Yes.

Q.—You did?

A.—The price was a considerable addition to the price quoted in the September previously, and I went into the question fully as to why the price had gone up and explained as well as I could the causes of the increase—on account of the increase in wages.

Q.—Did you not think it was very high?

A.—A very high price.

Q.—It came to something like £140 a ton deadweight?

A.—It is a very high price. Everything was a very high price at that time.

Q.—The price of such a dredger pre-war was about £36 a ton deadweight?

A.—Well, I could not say positively, but I know that generally the cost of work about that time was about four times more than it was pre-war, so that about fits in.

Q.—Was not it three times?

A.—I know in some things it was four times.

Q.—Shipping plates were £7 15*s.* against £22?

A.—We paid £28 a ton for plates.

Q.—That was in 1920?

A.—In 1920 and 1921 we were paying it. You had to pay what the price was.

Q.—Did you consider two hours a satisfactory test for this dredger?

A.—For cutting?

Q.—For anything, for a full test of the dredger " Sir George Lloyd "?

A.—That is what we usually do.

Q.—You thought that was ample?

A.—It gives you a good idea of the cutting power of the cutter. That is all we attempt to measure.

Q.—You think that is a satisfactory test?

A.—Certainly.

Q.—Did you design the shore pipes and floating pipes?

A.—Yes.

Q.—What did Sir George Buchanan actually do towards the design and construction of the dredger?

A.—Well, he had all the working drawings sent to him after we had reviewed them for his comments; and he made whatever comments he saw fit.

Q.—Did he make any?

A.—Yes, he made some comments.

Q.—Can you tell from your own knowledge what was about the peak price at the time of the peak in 1920?

A.—I could not tell you now. I could find it out, if you like.

Q.—Did prices fall about 20 per cent. in 1921?

A.—I should not think so, but if you would like to know, I would find out. I cannot remember now, but I do not think it was that much.*

Q.—There was a very sudden rise and a very sudden drop?

A.—Not a very sudden rise. It went steadily up from 1918, and it was going up in 1920. I cannot tell you right off, but certainly by 1922 they had begun to fall.

Q.—Take the price of ship-plates. The average price in 1907 was £7 2s. 6d; in July 1919 it was £18 5s. 0d; in May 1920 it was £27; in November 1920 it was £25 10s., and in June 1921 it had dropped to £15?

A.—Are those official quotations?

Q.—Yes, these are actual figures.

A.—I did not think they had fallen quite so soon as that.

Q. It is a very sudden drop in seven months. They have fallen 40 per cent?

A.—Yes. A good deal of that £27 steel was imported from America, I think.

Q.—In 1920?

A.—Yes. You could not get enough in this country.

Q.—It does not matter. That is the price?

A.—That is the price.

Q.—And that is the drop?

A.—Directly your demand stops, the price went down fairly rapidly.

Q.—That is what I am pointing out—that it did drop 40 per cent. in 1921?

A.—Yes, steel plates.

Q.—Ship plates?

A.—Labour did not drop 40 per cent.

Q.—No. There was no guarantee of the dredging plant after it left the Clyde?

A.—For material and workmanship there was the usual six months' guarantee.

Q.—That is a most unsatisfactory guarantee, is not it, when you are buying? They generally say: If you can prove a defect in the plate, and you will send it back to our works free of charge, and we find it is so, we will give you another plate?

A.—That is the usual thing.

Chairman.—Are you sure it was not three months?

A.—I do not think so.

Mr. Billimoria.—I think it is six months?

A.—That is the usual thing.

Chairman.—" We will be responsible for good quality material and workmanship employed in the construction of the plant, fair wear and tear excepted, for a period of three months from the date on which the dredger is set to work "?

A.—That is the first offer. We should have altered that afterwards to six months, I am sure.

Q.—Was it six months in fact?

A.—Yes.

Q.—You are sure?

A.—I am sure.

Mr. Billimoria.—In the original tender it is six months?

A.—This is the one the builders signed. This is the specification. You object to the word " contract," but this is what we call the specification and contract. The builders are to guarantee the vessel and her machinery against defective material and workmanship for a period of six months after the trials. The difference between the three months and six months represents what we put into the specification.

Sir Frederick Hopkinson.—The one is the builders' original specification and the other is the one on which the so-called contract was made?

A.—Yes.

Q.—After you had been called in to advise the Government?

A.—That is so.

Q.—It is understood that all the contracts stipulations are for working under ordinary conditions?

A.—Yes, I suppose so. I do not quite know what the application of that principle is.

Q.—There were no other trials than those we have referred to. Now we have the " Colaba's " trials, there are no others beyond those?

A.—No other trials were made beyond those.

* Information supplied by Sir John Biles in his letter dated October 8th, 1926. See Appendix II.

Q.—Was there anything in the specification as to the consumption of fuel, because in your report you say that it was very high on the trials. Was not there a specification as to fuel consumption in that document?

A.—I do not think there is.

Q.—Is it not usual to put one?

A.—No, not in that kind of vessel. The work is so uncertain and so irregular that you could not tell exactly.

Q.—Is there more regular or more certain work than dredger pumping? I should not have thought there was?

A.—Well, we did not do it. That is all I can tell you.

Q.—We always have it. We would not buy a dredger without it.

A.—The effect of it is that the builder says something which is very much higher that it generally works out to be.

Q.—We do not take what the builder says. We tell him what it has got to be.

A.—But you say in your contract that is shall not exceed a certain amount. The builder fixes that amount. He will not agree an amount that he cannot very easily do.

Q.—We should not give him an order until he agreed to what we think was right.

A.—You have not a very big field to select from. That is the difficulty.

Q.—I do not suppose you will agree with me, but I am going to suggest that the trials generally of the plant were of a perfunctory nature?

A.—No, I should not agree with that. I should like to know how we could do it better under the circumstances.

Q.—I should not have been satisfied with a two-hours' run for that dredger.

A.—I see.

Q.—I should not have been satisfied, from what I have seen, with the trial of the "Colaba."

A.—What would you have expected to find, if you went more than two hours?

Q.—I should want to try it under working conditions.

A.—You cannot do that without taking the vessel to Bombay.

Q.—I do not agree with you. There are the working conditions in the Clyde, so far as they applied.

A.—Well, I should like to know how we could do it. I do not know anybody that does it under any more onerous conditons that we are doing it.

Q.—Had you seen that sample before you designed the "Sir George Lloyd" dredger, would you have designed it as it is built to-day?

A.—If I was told that we had to dredge that and nothing else?

Q.—That and mud?

A.—Well, mud you can dredge. The bigger your cutter the better.

Q.—You do not want a cutter.

A.—You do not want a cutter? It depends on how dense and heavy the mud is, does it not?

Q.—It would not be very dense, going through the pipe—it is only dirty water.

A.—Anyhow, if you have got to cut this stuff——

Q.—Obviously you have to.

A.—If you have got to cut this stuff——

Q.—You have to cut it up, so that the pump will throw it?

A.—What I want to say is this: If you have got to cut this mud stuff, if the mud is of such a character that it will not flow into the suction pipe by the mere pumping, but you have got to cut it—then, if there be a large proportion of that mud, you want a big cutter to get your quantity. If you had at the bottom of that a harder stuff to cut, then that big cutter is not suitable for it, and you want something else.

Chairman.—Sir Frederick Hopkinson's question to you is: If you had had that sample in your hands at the time when you were considering the design of the dredger, would you have designed it in the way in which you did design it?

A.—Well, you must tell me something more about what there is besides that hard clay.

Sir Frederick Hopkinson.—Mud.

A.—Well, then, the quantity of mud in relation to that must also be considered.

Q.—You had to throw 2,000 yards of that hard clay per hour?

A.—Apart from mud?

Q.—Apart from mud.

A.—Then, as I have said before, you would want two dredgers to do it instead of one.

Q.—You could not have designed a cutter which would have cut 2,000 yards of that stuff an hour, could you?

A.—Well, I do not say I could not. I should think that probably the best thing is to cut with two dredgers at 2,000 yards an hour.

Q.—This clay was described, when it was originally bored, as being stiff and unctuous. I have never heard the expression before. I asked the chief engineer out there if, after his three or four years' experience of this clay, he could find me a better definition. He thought for some time and then said he could not. My own personal opinion is that I do not think I could find a better description of that clay after seeing the lot of it.

A.—Is *that* what you call stiff and unctuous?

Q.—Yes.

A.—Well, I should not.

Q.—Would you call it hard?

A.—I would call it hard.

Q.—That is unctuous when it is wet.

A.—If it is as hard as that when it is wet, that is a different story.

Q.—No, it is not.

A.—Then it is a different kind of clay.

Q.—No, it is the same.

A.—I could not judge of that clay in its present form, because it is dry.

Q.—Is not its weight a sufficient indication to you? You feel the weight of that, and tell me if you think it does not go about 16 feet to the ton?

A.—Supposing you take soft clay and let it dry, will not it be as heavy as that?

Q.—No, certainly not.

A.—I am not so sure. I have told you I am not an expert in clays.

Q.—You got a percentage of solid material on your trial of 39 to 41 per cent.?

A.—It was only what was scooped up from the tail end of the discharge pipe, and put into buckets. It was not any good.

Q.—It was not a fair test?

A.—No. I do not consider that is a fair test at all.

Q.—What would you think would be a fair dredgable quantity? On what do you base your calculations—what percentage?

A.—About 10 per cent., and this trial turned out from 25 to 31 per cent. of stuff——that is the cutting trial.

Q.—39 to 41 per cent. is what is given to us.

A.—That is misleading.

Q.—I think so too.

A.—I know exactly what happened. They got buckets, and every now and then they take the effluent, let the buckets settle and then measure.

Q.—It is not a fair test?

A.—No, it is not a fair test at all. I object to the test, but there it is.

Q.—The only fair test is to take the quantity actually removed from the bed of the sea, and divide it by the time?

A.—Yes.

Q.—You know what your pump will throw of water, and the mud or clay, or whatever it is, is a certain percentage of the total volume. That is the only fair way to take it?

A.—That is the only fair way to take it. If you know the velocity of the water and the amount you cut, you know then the percentage.

Q.—What velocity is the "Sir George Lloyd" designed to work at?

A.—About 15 feet a second.

Q.—That is very high, is it not?

A.—That is what she is running at.

Q.—The "Kalu" and "Jinga" only went at 12?

A.—I think I have expressed it here in figures. It is estimated what the head would be at 15 feet per second, and we obtained more than the head in the pump.

Q.—What do you reckon that pump would throw of water and solid matter at 15 feet per second—how many cubic yards?

A.—That is in this statement.

Q.—I wish you would find it for me?

A.—The percentage of spoil under those circumstances is 10·4. The speed is 15 feet per second, and that 10·4 is 2,000 cubic yards, so it would be round about 20,000 cubic yards.

Q.—That is an extraordinary quantity, is it not?

A.—Water and spoil.

Q.—It is an extraordinary quantity, is it not? I calculated it out at 700 feet per minute. That only comes to about 12,000 cubic yards an hour. You go faster than that, but that only gives 12,000 cubic yards an hour?

A.—It is only a matter of arithmetic. I am only guessing from the figures I have given. I will give you a corrected statement if you like.

Q.—I would like it, because to get your 2,000 yards an hour you must throw 20,000 yards of water and solid material, must you not?

A.—Yes.

Q.—It is a matter of arithmetic. We can calculate that at 15 feet per second?

A.—9·6 is the area of the pipe in square feet. 15 feet per second is 15 multiplied by 3,600, multiplied by 9·6 and divided by 27. I have not got the calculation here, but my assistant makes it 19,200.

Q.—That gives you your 10·4. You have got to do that to get 2,000 yards an hour?

A.—That is so.

Mr. Billimoria.—It has been suggested in India that, because of the unemployment in this country in about 1920, orders for dredgers to the tune of one million pounds were placed in this country. Have you any observations to make with regard to that?

A.—There are many evil suggestions made in India as well as elsewhere. I have nothing within my knowledge that those dredgers were ordered on account of the unemployment in this country—nothing whatever.

Q.—You can say that very definitely—that if for political reasons such a suggestion has been made it merely exists in the imagination of those who make it, and that it really is not a fact?

A.—As far as I know that is so.

Q.—Then can you tell us where was the hurry in placing this order for dredgers? The dredger arrived in Bombay and was lying in the harbour for over a year unemployed. Where was the hurry for placing the order?

A.—I do not know.

Q.—You know for a fact that the dredger was not used for over a year?

A.—I do.

Q.—You know that prices were very high in 1920 and that subsequently they came down considerably?

A.—I do.

Q.—If the order, therefore, had not been placed in that desperate hurry, a sum of money both in respect of principal and interest would have been saved?

A.—That I do not know.

Q.—The facts go by the figures?

A.—But you have only stated two of the facts. There may have been other facts which came into it which would have made the dredgers cost more; I do not know.

Q.—But the prices as a matter of fact did come down subsequently to 1920?

A.—That is so.

Q.—And if the order had been placed later on it is just possible you would have been able to secure much more favourable terms?

A.—That is so.

Q.—And if you had to pay a smaller amount you would have saved considerably both as regards principal and interest?

A.—I do not know about that.

Q.—That is a natural consequence. If you do not want to answer it, that naturally follows it.

A.—I do not know what consequences would have followed the dredger not being delivered at that time.

Q.—Is it usual to allow a commission of 1 per cent. to the naval architect? Is that the usual procedure?

A.—That is a fixed scale which has been agreed between the Secretary of State and the naval architect for the last 40 years.

Q.—Is it in connection with any order placed by the Government of India in this country that the naval architect comes in for his share of 1 per cent. commission?

A.—Not any order placed by the Secretary of State, but any order in which the naval architect is employed.

Q.—So you take a certain responsibility when you accept this 1 per cent. commission? What was your responsibility?

A.—I think I have defined that already. It was to see that the dredger was designed and built in accordance with the conditions laid down by the engineer to be fulfilled.

Q.—Were you responsible then for the specifications?
A.—Yes.

Q.—You designed a dredger for a material which you say has now proved not suitable for the dredger?
A.—I did not say so.

Q.—Well, it has been proved otherwise. If the dredger is not at fault, it is the material which is at fault?
A.—You say it is, yes.

Q.—Is it prudent for any business man, particularly for a gentleman of your experience, to place an order for one million pounds for an article which is not going to prove successful in the end?
A.—I suppose the obvious answer to that is that it is not prudent, but that is not what I did. I advised the Director of Stores to place an order which was to fulfil certain conditions and that order did fulfil those conditions. That is all I have to say.

Q.—So when you received a certain amount of remuneration in connection with the placing of the order, and seeing to its execution, did not you think it desirable to advise that you ought to be acquainted with more details about it before placing it?
A.—No.

Q.—It was not part of your duty?
A.—No, it was not part of my duty. I had sufficient information to carry out that order.

Q.—You merely relied upon whatever Sir George Buchanan suggested. Is that what it comes to?
A.—I did not interfere with Sir George Buchanan's judgment on these things. It was no part of my duty to review his works. I had definite instructions what to do, and I did it.

Q.—From whom?
A.—From the Director of Stores. I was to carry out the specification which was outlined in the report.

Q.—Why were you brought in at all? Sir George Buchanan could just as well have drawn up a specification, and gone to the builder and said, "Here you are, you prepare this." Where did you come in? What was your advice wanted for?
A.—The reason I was brought in was that the order was given by the Director of Stores, and the Director of Stores has to have someone to advise him that the order is carried out properly.

Q.—You simply looked to the building of the dredger, and nothing more?
A.—I looked to the building of the dredger and to the carrying out of what I was instructed to carry out.

Q.—Under what circumstances was Simons engaged on this job? There were other tenders invited. You have told us in the course of evidence this morning that none of those tenders were placed before you. You were not consulted. Why was Simons preferred in particular?
A.—You must ask somebody else that question; I do not know. That is what I was told to do.

Q.—Did you not enquire if there were any other tenders available, or otherwise, before placing the order?
A.—I did not.

Q.—Was it not part of your duty?
A.—No, it was not. I did not know that other tenders had been taken.

Q.—Did not you consider it prudent to call for tenders from other builders on the same specification to see whether you could get more favourable terms?
A.—My orders were to deal direct with Simons.

Q.—Who gave you those orders?
A.—The Director of Stores.

Q.—You did not enquire why Simons were to be preferred?
A.—I did not.

Q.—Either officially or unofficially?
A.—Either officially or unofficially. So far as I remember, I did not.

Q.—Do you thereby suggest that other tenders which were invited were more for a matter of show or formality than anything actually coming out of them?
A.—I do not suggest anything about it.

Q.—Do you consider that the test on the Clyde was absolutely sufficient—a two-hours' test on the Clyde, without knowing what material this dredger was going to pump in Bombay harbour?
A.—I have said so already.

Q.—You still adhere to that opinion?
A.—I do.

Q.—You know that the material in the Clyde is not the same as in Bombay?
A.—I do.

Q.—Do you not think it would have been desirable for you to have ascertained as to whether it was the same kind of material or different which this particular dredger was expected to pump?
A.—I was told the material which the dredger had to be designed to cut.

Q.—They did not submit to you any sample?
A.—They did not.

Q.—And you did not think it desirable to call for any sample?
A.—Not with an engineer giving me orders on that subject—certainly not.

Q.—You suggested that, in the event of a trial being given in Bombay harbour, the manufacturers would have called for a higher price. Do you not think it would have been desirable and prudent to have paid a better price and to have had the right sort of machine, than to have paid a lesser price and to have the whole scheme a failure?
A.—Of course, that is obvious now. You can say that now.

Q.—At the time it did not strike you?
A.—Do you think that I knew that the whole scheme was going to be a failure?

Q.—No, but is it not better to pay 10 per cent. or 20 per cent. more and be sure of your ground, and to know that it is going to pay you rather than pay something which, in the end, results in a terrible loss?
A.—Would you have been sure of your ground by paying 20 per cent. more?

Q.—We could have held somebody responsible for it if the dredger had failed.
A.—That would not have helped the scheme, would it?

Q.—To a very great extent, certainly. We could have got back the money from the builders of the dredgers. As it is, we have paid a million pounds and we are nowhere.
A.—Perhaps the builders would not have been able to have given you back a million pounds.

Mr. Billimoria.—That is another matter.

Chairman.—The builders would have said, " We bargained to cut soft clay."

Mr. Billimoria.—That would have been a different story.

Witness.—Could you have been sure to have got the builders to undertake that work?

Mr. Billimoria.—In certain other cases, as a matter of fact, manufacturers of machinery always give a guarantee that a certain quantity of output will be given.
A.—Do you know of any gun-maker who will guarantee that any man can knock down so many birds with his gun?

Q.—I do not know about a gun-maker, but I know about ordinary manufacturing concerns where that sort of guarantee is usually given?
A.—The guarantees are different under different circumstances, and the builders in my opinion would have been quite justified in refusing to undertake any such guarantee.

Q.—Was any attempt made in the direction of securing a guarantee of that nature?
A.—No, not that I know of.

Q.—Who is responsible for drawing up that contract specification—the printed document which has been read out?
A.—I am.

Q.—Do you think it is an exhaustive document drawn up in the usual course of business?
A.—It was exhaustive enough to build the vessel and see that she fulfilled the conditions laid down in the contract.

Q.—If she fails to fulfil those conditions, what are the remedies?
A.—She did not fail.

Q.—She has not been giving the output of 2,000 cubic yards an hour?
A.—She did not fail to fulfil the conditions laid down in that contract.

Q.—But that is what the actual result proves.
A.—No. The dredger has not failed at all. The dredging operations have not been as successful as somebody wanted them to be.

Q.—Dredging operations would mean what—the material or the labour employed?
A.—There is the material, and there are the people employed—all things which are independent of the construction of the dredger.

Q.—Have you any positive proof or information to substantiate the statement that it is not the fault of the dredger but is purely the fault of the men employed and the material there?

A.—You have the evidence given by several of your witnesses. I am only quoting from the evidence.

Q.—You are simply relying on what other people have stated?

A.—And also upon what I know myself.

Q.—You are absolutely positive that the dredger has not failed?

A.—I am.

Q.—And that if the material for which she was intended to be built had been there, she would have given the necessary output?

A.—She would.

Q.—Then anybody who gave you the instructions to get the specifications prepared for a particular class of material would be the person solely responsible for the failure?

A.—You must judge of that.

Q.—I want you, as an ordinary prudent business man with a vast experience, to answer that question?

A.—I am not going to answer it, if you will kindly excuse me.

Chairman.—I think Sir John is right. That is what we have to decide, and I doubt if we ought to take the opinion of any witness on the point.

Mr. Billimoria.—Then I will leave it at that. Where there are two or three shifts at work you do not expect to have the same output for every shift, do you? There would be a little break, and naturally the average would go down.

A.—I did not quite catch that.

Q.—If a dredger is working with two or three shifts, the output on the average would not be the same per hour?

A.—I do not know. The machine, if it is working, would give the same output. Whether the men could keep on making the machine do the work, I do not know.

Q.—This dredger was intended to work for 15 hours. Would she have given 2,000 cubic yards an hour continuously for an average of 15 hours—that is, 30,000 cubic yards during the day?

A.—No, I do not suppose she would.

Q.—So anybody who based his calculations on such a theory or basis would be entirely wrong?

A.—You must judge again, please. I have already dealt with that question. The dredger might have got more. Some people say she could do 3,000 cubic yards per hour, and if she worked 15 hours and lost one-third of the time on 3,000 cubic yards per hour she would do 30,000.

Q.—In the course of your evidence you have suggested that the only remedy you can suggest is the doubling of the plant—to employ two dredgers instead of one in order to get the necessary output?

A.—I did not say it was the only remedy I could suggest.

Q.—It was one of the remedies?

A.—That is the only one I have suggested, and, as I said, I do not know that I am prepared to recommend that; but that is a way.

Mr. Billimoria.—A doubling of the plant means a doubling of the initial cost?

Chairman.—That will not meet with enthusiasm in Bombay.

A.—I expect not.

Sir Frederick Hopkinson.—Under the circumstances it is impracticable.

A.—It would not have been impracticable three years ago.

Mr. Billimoria.—Why does the question crop up now, when originally one dredger was expected to produce 2,000 cubic yards? Why is it now suggested that there should be a double plant? If she had given 500 cubic yards you would have suggested four plants instead of one. Is that what it comes to?

A.—The material has turned out to be such as it is, in which you can apparently only cut 1,000 cubic yards per hour.

Q.—The cost, both as regards the cost of the plant and of the working, would, therefore, double?

A.—No. You would not pay double now for a dredger.

Q.—Because prices have gone down?

A.—Yes.

Q.—And it would be proportionately less?

A.—Yes.

Q.—But the working costs would be double if two dredgers had to be worked?
A.—Yes, I suppose so.

Q.—And interest on the amount already spent and to be spent would have to be added to the cost?
A.—I suppose so.

Q.—Which would make the scheme, which at one time appeared to be profitable, a losing bargain?
A.—That I know nothing about.

Q.—This morning you suggested something about the "Colaba"—that she was built principally with the object of being able to be converted into a dredger. I could not quite catch exactly what you wanted to convey thereby. I thought you said that she had been built with the object that she could subsequently be converted into a dredger and be used as such instead of as a pontoon?
A.—I do not think I said she was built for that purpose, but I did say she could be converted from a booster to a dredger by fitting the cutter in front, and then her propelling engines would be of use to her.

Q.—Do you think, as she is built now, that she could be so converted?
A.—She could be used.

Q.—Is she long enough for it?
A.—She might have to be lengthened a little.

Q.—That would mean all material alterations?
A.—Of course.

Q.—And adding considerably to the cost of the plant?
A.—It depends on what you sold the plant for or what you valued it at at the time. You would have to spend money on the "Colaba" in order to make her into a cutter, of course.

Q.—I want to ask you one last question. I do not know whether you will be prepared to answer it or not. It is this: Is it the usual practice with builders to allow commission openly or secretly to an individual who places an order?
A.—I do not quite follow that.

Q.—Is it the practice, or is it usual, to allow any commission, openly or secretly to anyone who places an order, or anyone who favours a manufacturer or a builder with an order?
A.—As far as I know, it is not the practice.

Q.—Is it done in some cases?
A.—You must ask somebody else.

Q.—As far as your experience goes?
A.—No.

Q.—It is never done?
A.—I do not say it is never done. As far as my experience goes, I say no. I do not know whether you have anything in your mind with reference to me personally?

Q.—No. It is not in connection with you. I make that perfectly clear. I do not suggest anything against you, Sir John, but it has been suggested that there was a certain amount of hurry because somebody wanted to make some profit out of it.,
A.—I did not want to and I did not make any, and, as far as I am concerned, that ends the thing, does it not?*

Q.—You have made your position perfectly clear by telling us that you did not care to know what the other tenderers did actually offer, or what the tenders were, and why one particular firm of builders was preferred.
A.—No, I did not say that. I was told to go to that builder alone.

Q.—It was all cut and dried. You were simply asked to do a certain thing?
A.—I do not know what you mean by "cut and dried."

Q.—Everything pre-arranged.
A.—It was considered, under the circumstances, that the right thing to do was to go to Simons. That is all I can tell you. Under the circumstances, it was considered the right thing to do, and I carried out my instructions.

Sir Frederick Hopkinson.—We were talking just now about the speed of the dredging—the effluent, 15 feet per second. Since then I have had a word with the chief engineer in charge of the works out there, and he says that, with the engine going at its full normal contractual speed, they did not get more than 12 feet per second.
A.—How did he get that?

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* Sir J. Biles has asked that it should be made clear that the commission or profit here referred to is distinct from his official fees. The only money he made was the fees paid him by Government on the usual scale for work done.

Q.—The measurement was made by a Mr. Settle, who is now a partner of Sir George Buchanan, I believe.

A.—How did he do it?

Q.—He took it from the curve of the discharge.

A.—Well, if you get a certain pressure behind a mass of water, you can drive that at a velocity, and only one velocity, can you not? You have the friction of the pipe to take account of.

Q.—I would not say only one velocity. It depends what power you put behind it.

A.—I said a head—a certain pressure behind.

Q.—It is the usual practice, in measuring flow of velocity, to take the curve, is it not?

A.—The effluent curve, yes. That is one way.

Q.—If that is the case, and they never got above 12 feet a second, it destroys the whole of your figures about the 2,000 yards an hour, because it brings it down to about 1,200 yards an hour?

A.—What it would do would be to alter the percentage of spoil that went through the pipe. I do not admit these figures at all. We have measured these things on similar ships. I do not know the circumstances under which this 12 feet was measured.

Q.—If the engine is running at its designed speed, and you only get a discharge rate of 12 feet per second, it does away with your possible 2,000 cubic yards an hour?

A.—Why?

Q.—Because you cannot get it.

A.—What you have to do is to increase the percentage of spoil that goes in the pipe, and you get your 2,000 cubic yards. I have assumed 15 feet a second. I have assumed that 2,000 yards goes through. Then I find that percentage to be 10·4. If you say it is not 15 feet per second but only 12, and the 2,000 cubic yards go through, then the percentage of spoil is higher.

Q.—But you have told us that 10 per cent. would be a reasonable percentage to expect?

A.—You asked me what we used to work to.

Q.—10 per cent.?

A.—Yes.

Q.—If you had asked me, I should have said the same thing. Here we have a definite statement that the speed was 12 feet per second. At 10 per cent. you would not get anything like 2,000 yards an hour. You must have a larger percentage of solid matter?

A.—That is right.

Q.—And we do know that the results given show that the dredger was only doing half its stipulated output. Therefore, you could not have much more than 5 per cent.?

A.—That is so.

Q.—5 per cent. of solids?

A.—Yes. Therefore, there was not enough material going in the pipe. We do know that the cutter cut enough of the stuff on the Clyde to put through about 28 per cent.

Q.—It is no good you and I talking about the Clyde and Bombay. *That* is the clay which had to be cut there, and you designed a cutter to cut something entirely different. Therefore, there is something wrong somewhere, is there not?

A.—Something different.

Q.—There is something wrong from my point of view

A.—I do not know it is wrong from my point of view.

Q.—Of course, the dredger was designed for ordinary dredgermen to work. You did not expect to get supermen for it?

A.—No.

Q.—But only the best you could get?

A.—Yes.

Mr. Billimoria: Would the length of pipe line in any way interfere with the output of the dredgers?

A.—Of course. You were running in some cases up to 7,500 feet. You must have less output at 7,500 feet than at 5,000.

Q.—At the time the order was placed was not that particular point carefully considered—as to what length the pipe line was to be?

A.—Certainly. It was specified at 5,000 feet.

Q.—Was there any occasion to increase it? Had the circumstances so altered as to necessitate an increase in the pipe line?

A.—You must ask somebody else that. I do not know.

Q.—That would be one of the reasons for a smaller output?
A.—There would be a smaller output with that.

Chairman.—With what?

Mr. Billimoria : With a lengthened pipe line.

Chairman.—But as long as the pipe line was limited to 5,000 feet you would get your specified output, would you?
A.—That is so.

Q.—On the occasion when the " Sir George Lloyd " was working by herself she did, in fact, run up to something over 7,000 feet?
A.—That is so. Then the output would be less.

Q.—Then Mr. Billimoria's point would come in—that you would not expect the same output?
A.—That is so.

Q.—But the figures are very curious about that. In one or two instances you get quite a high output with 7,000.
A.—But you could not say that, if you had taken 2,000 feet off of that pipe, you would not have got a higher output at that time under those circumstances. You cannot say that putting on 2,000 feet of pipe has increased the output.

(*The Witness withdrew.*)

42nd Witness, Mr. William Lochiel Sapte Lovett Cameron, C.S.I., A.M.I.C.E.

WRITTEN STATEMENT.

Successive Governors of Bombay had been impressed with the opportunity offered for reclamation by the rocky foreshore on the West of Colaba. Committees had been appointed and reports prepared but no definite action had been taken. When Lord Lamington was Governor, however, further progress was made, soundings were taken and a rough scheme prepared under the control of the late Mr. W. H. White, Chief Engineer. When Lord Sydenham, then Sir George Clarke, became Governor further investigations were made, and, in reply to a question in the Legislative Council inquiring what Government proposed to do in connection with the reclamation, a long reply was published. Mr. White's soundings had been taken on the West side of Colaba, but Mr. W. Kidd, who had recently completed a contract on which he had been engaged, and who, hearing of the intentions of Government, had submitted proposals, said that extensive reclamation could be effected only with the aid of powerful suction dredgers combining the latest improvements. Such dredgers, he said, could not work efficiently or economically in the Bay owing to the deposit of sand being so shallow. He stated, however, that he believed that plenty of suitable material could be obtained on the harbour side. At his own expense he took some soundings and borings in the harbour, and he informed me that the result exceeded expectations. The quantity of harbour silt was small, and below it was a great depth of excellent, odourless blue clay. He believed that the quantity would be ample, but, naturally, he could not guarantee this until detailed surveys had been made. A rough preliminary estimate was made, and early in 1911, I think, a letter was sent to the Government of India giving the history of Back Bay from the time of the unfortunate " Share Mania," stating what the proposals of the Government were, and asking for administrative approval in the first instance.

When Mr. Kidd was invited by Government to make a complete survey and prepare a detailed scheme on the lines already laid down, that is for a reclamation of a little over 1,100 acres with an outline of pleasing curve, I was no longer in the Service, but my interest in the great scheme was unabated. I had many conversations with Mr. Kidd, and I was pleased, but not surprised, to learn that the detailed survey of the harbour had fully confirmed the information he had gathered from the original soundings. The quantity of material to be found within working distance of the shore was considerably more than that required for the whole reclamation. But he repeated what he had said before, viz., that the dredger would have to be specially designed to do the work required of it. The dredging chart would, of course, have to be carefully prepared before work was started, and it was imperative that it should be rigidly adhered to if confusion was to be avoided.

Had I still been in Service and had I been responsible for the final estimates I should not have had the slightest hesitation in accepting Mr. Kidd's survey and soundings as correct. There would be two reasons for this. In the first place I know Mr. Kidd to be most cautious and careful, and one who would never make any statement

unless he could by personal observation vouch for its accuracy. In the second place his pecuniary interests were inovlved. It appeared certain at the time that when the undertaking was sanctioned its execution would be entrusted to him, and then, if events proved that his calculations were faulty and that the estimated cost would be increased owing to the dredger having to move further into the harbour than intended, he would, under the arrangement that had been made with him, suffer considerable pecuniary loss. This knowledge would have instilled caution even into one who was not habitually careful and cautious.

In conclusion I should like to say a few words on the finance of the original scheme. At an early stage it became apparent that the reclamation could not be financed if the actual work was done in the cheapest way; that is to say, if it was pushed on vigorously and completed in some seven years. The area of land that could be taken up annually for building purposes was comparatively small, and an enormous area would for a long series of years have lain infructuous, and the capital at charge would have mounted up at ruinous speed. At the time, i.e., in 1910-11, the Government of India could borrow at the low rate of $3\frac{3}{4}$ per cent. but even at that low rate of interest, Rs. 100 would in 60 years have amounted to no less than Rs. 910. It is clear therefore that the important factor was not so much the initial cost of the work as the increasingly rapid growth of the capital at charge. Lord Sydenham, it is hardly necessary to state, appreciated immediately the importance of compound interest and of a low rate of interest, and he approved without hesitation of trial estimates being made of the cost and the financial result of doing the work in sections. The advantages of doing the work in this way would be considerable. The area reclaimed would never have been hopelessly in advance of the demand; the experience gained in completing the first section would have been invaluable; and Government would have held control of future operations, deciding when to start the next section and whether the rate of progress should be accelerated or retarded. Apart from the necessarily increased cost, the only disadvantage, as far as I could see, would have been that the expensive plant, if not disposed of, would have lain idle for some years, and provision would have had to be made to meet the interest on its cost and the maintenance charges of all kinds. The financial results of one trial scheme of sectional working based on figures of cost supplied by Mr. Kidd was worked out before I left India, and it showed that the reclamation not only would be a beautiful addition to a beautiful City, but also could be made highly remunerative. The assumptions made in preparing the financial forecast were (1), that on the average 60,000 square yards would be taken up annually, and (2), that the letting rate would be that based on a value of Rs. 25 per square yard. The figure of 60,000 square yards per annum had appeared in Mr. White's scheme, and it was adopted tentatively, as there was no reason to alter it. On this point, however, Lord Sydenham's Government hoped to obtain guidance from public opinion. But public opinion was silent, and eventually Government appointed a Committee of prominent Bombay citizens to advise them. The Committee reported that the Government estimate was not unduly optimistic and therefore the figure remained. The price of Rs. 25 a square yard on what would have been a magnificent site I considered low. After my retirement other tentative schemes were prepared, but of them I am not in a position to speak.

Oral Evidence.

Chairman.—Were you Secretary to the Government of Bombay Public Works Department and Chief Engineer during the years 1906 to 1911?

A.—I was.

Q.—Did the Public Works Department take any borings whatever of the harbour during that period?

A.—Yes. Mr. White, who was the Chief Engineer before me, took borings—or rather, he ordered borings and soundings to be taken. They were in the Back Bay.

Q.—That was not my question. My question referred to the harbour.

A.—I beg your pardon. No, none.

Q.—Were you in office at the time Mr. Kidd made his report?

A.—In 1910-11, yes, I was.

Q.—When he made his report?

A.—Not his final report. He made a report in 1912. While the project was going on I was in the office.

Q.—Were you present at any time when Mr. Kidd took any borings?

A.—No. In my time only a preliminary estimate was made. No detailed borings were made until afterwards when the Government invited Mr. Kidd to go out.

Q.—There was a preliminary estimate made, and then I think Mr. Kidd suggested that for 75,000 rupees, plus 87,500, he would give a full report. You remember that?

A.—I do not know the figures. That was the case. That was just after my retirement.

Q.—The report came after your retirement?

A.—The call on him to make the detailed survey came just after my retirement.

Q.—Therefore, so far as the sufficiency or accuracy of any of Mr. Kidd's borings are concerned, you are quite unable to give any information whatever?

A.—Quite.

Sir M. Visvesvaraya.—Did Mr. Kidd utilise any of the surveys which had been previously made by the Public Works Department officers?

A.—No, because I think the previous soundings had been taken on the West of Colaba, that is in Back Bay and round by Malabar Point. Mr. White had not gone into the harbour itself. The actual area of reclamation had to be re-surveyed for the outline adopted in my time was entirely different from that in the original proposal. The detailed survey for this was undertaker by Mr. Kidd.

Q.—No soundings were taken in the harbour by the P.W.D. officers?

A.—Not that I remember—certainly not by me, and I do not think by Mr. White.

Q.—The filling of the reclamation area—the depths to be filled—was ascertained on surveys made by the P.W.D.?

A.—The depths to be filled where? Do you mean in the reclamation area?

Q.—Yes, in the reclamation area?

A.—The quantity of filling was ascertained by surveys, but soundings were made on the west by Mr. White. There was not enough material in the Bay, so they went outside Malabar Point, and round there, taking soundings.

Q.—Was not the Basin Survey made by you—I mean the 1,100 acres. Were not the soundings taken there by the P.W.D.?

A.—The quantity of filling required for the reclamation was ascertained by surveys carried out under Mr. White, but the soundings in the harbour to ascertain the quantity of material available there were taken by Mr. Kidd. In my time all that we could do was to make a preliminary estimate. We wanted to get administrative approval only. We only wanted to show that the scheme was feasible and that, if carried out according to the rough lines which were laid down, it would be remunerative. We merely wanted administrative approval. On getting administrative approval from the Government of India, then we would have worked on the ordinary lines of the P.W.D. and would have worked out detailed schemes.

Q.—But for your preliminary information you had to take soundings at the Basin?

A.—The figures of filling had been calculated from Mr. White's rough survey, but new surveys had to be made owing to change of outline, and they were carried out by Mr. Kidd.

Q.—Was not Mr. Kenball doing some of the surveys?

A.—Not in my time. I do not know if he did afterwards. He succeeded me as Chief Engineer.

Q.—From your experience of the area there, could not the filling have been made by murum or earth at a reasonable cost?

A.—I never considered the question at all, because it seemed to me that, for a huge area like that of 1,100 acres, it would have been perfectly hopeless to do the work by the spadeful. In my opinion, you had to go in for the thing on a comprehensive scale, and to do the work with modern appliances.

Q.—The estimate in your time was about 325 lakhs?

A.—Yes, for works.

Q.—For 325 lakhs it would have paid to have purchased dredgers and to have worked them by scientific methods?

A.—That was the arrangement.

Q.—But if the cost went up to 702 lakhs, would you have still adhered to your dredging proposition?

A.—One would have to consider trial estimates and to see what the cost would be, and what the returns would be—whether the revenue would come up to, or exceed, the expenses, including interest and all the various charges.

Q.—These questions did not arise in your time?

A.—No.

Q.—You thought it cheaper to do the work by dredged filling.

A.—Yes.

Chairman.—What work?

A.—The reclamation—the filling.

Q.—What reclamation?

A.—On the Back Bay—that sweep which there is on the Back Bay.

Sir M. Visvesvaraya.—What was the rate per hundred cubic feet in your time, roughly, for murum filling?

A.—A little over 2 rupees for a hundred cubic feet.

Q.—That means about 12 annas a cubic yard?

A.—Yes.

Q.—Mr. Kidd promised about 8 annas per cubic yard in his estimate. We have it here.

A.—It was rather less than that—the first one. They kept on varying. We had a large scheme and then a smaller scheme, and the smaller you made the scheme the more expensive it became per cubic yard.

Q.—If you are told now that the total cost would be about 460 lakhs—dredgers, working expenses, and everything—in order to do the reclamation by dredger, which would you prefer?

A.—If I could get murum, in every way I would prefer murum filling at a reasonable cost. With regard to the other, I should try to work it out by taking the costs, interest, depreciation, and all those things, and then compare one set of figures with the other. If I went in for murum filling, the plant required would be merely a few thousand wagons and nothing more; whereas with the other, I should have to have very expensive plant. The dredging plant would be very expensive. The interest charges on that would keep going on. All those things I would have to consider. It would be perfectly impossible for me to say that one system would be cheaper than the other until I made the actual calculations and saw what the result was.

Q.—In your time it was about 12 annas per cubic yard?

A.—Yes.

Q.—Now it is much more. It is about 1 rupee 4 annas per cubic yard murum filling because prices have gone up. If you knew that, in order to complete the reclamation, it would cost about 1 rupee 8 annas per cubic yard or more than that by dredging, you would certainly have preferred murum?

A.—In every way I prefer murum as a material, and if it was not going to cost more than the other, I should certainly go in for murum, but I do not know which would cost the more.

Q.—At present you may take it that the estimate comes to about 460 lakhs for dredging about 28 million cubic yards. You would certainly consider that a very expensive proposition?

A.—Certainly.

Q.—That is without taking interest and depreciation into account. They have opened a new Development Department in order to carry out this work, along with other development works, have they not?

A.—Yes.

Q.—Do you think it was safe to have entrusted the work to a new agency, when Government had their own Public Works Department?

A.—It would be difficult for me to speak on that matter. I was the head of the Public Works Department, and I should have preferred to carry on the work ourselves; and we should have been able to do it.

Q.—Could not you have supplied two or three engineers who could have done the work under the advice of a consulting engineer?

A.—Yes.

Chairman.—When did you leave India?

A.—1911.

Q.—We are now talking about 1920. The Development Directorate was created in 1920. It is rather a difficult question for you to answer, is it not? You were asked whether, you, having left India in 1911, the Government were wise in 1920 in creating the Development Directorate and whether you could not have found engineers capable of doing this gigantic task?

A.—I thought the question was if the point had arisen in my time.

Sir M. Visvesvaraya.—If the question had arisen in your time would you have done it through the Public Works Department or have started a separate department?

A.—I would have done it through the Public Works Department, but with proper expert advice, because we realised very fully that there is nothing more expensive—I might say ruinous—than amateur engineering.

Chairman.—And the Public Works Department would want the assistance of proper marine experts?

A.—Undoubtedly.

Chairman.—And not indulge in amateur engineering.

Sir M. Visvesvaraya.—The engineering side of it, apart from the reclamation point of view, is very simple, is it not? You have a sea wall and earth filling?

A.—The civil engineering part is very simple.

Q.—The hugeness of the scheme depends upon earth filling practically?

A.—Yes.

Q.—Apart from a few technical details which have to be taken from consulting engineers, the rest is all a plain engineering proposition?

A.—Yes.

Q.—The Sukkur Barrage work is being done on the same lines now, is it not?

A.—I do not know.

Q.—In any properly established department you have permanent officials who remind you about the various processes—accounts matters and technical matters. There are subordinate officers who remind the head of the department about these things?

A.—You mean carrying out ordinary works?

Q.—Yes.

A.—We have accounts, and we have a register of works showing how the work is proceeding month by month. We have everything like that.

Q.—In an old established department all these things must and will go through properly, but in a new department they are liable to be omitted?

A.—There is a danger of that.

Q.—And there has been that danger in this case?

A.—Has there?

Q.—Have you any remarks to make about the methods of construction? They commenced constructing the sea wall from both ends. Would you have tried to do so from your knowledge of the position?

A.—When I went into the question of that awful compound interest, I saw it was perfectly hopeless to do the thing in the cheapest way. It was absolutely necessary to keep the reclamation not too far ahead of the demand. What we had to do was to cut the reclamation into sections and do a piece at a time. When you do one piece you can so arrange it as not to go too much ahead. You then get invaluable information, and Government would have the whole thing under constant control. With regard to that expensive sea wall, you would merely make the little piece that was required; you would make your blocks for the section, and when you carried on again those blocks could be used for another piece of wall, and you would make your line up and put other blocks against them. That seemed to me the only way in which I, at all events, could make the works feasible.

Q.—Otherwise it gets beyond control, as it has happened in the present case?

A.—It would with me.

Q.—What are your views on the financial position of such works generally?

A.—Approximately what I have put down in my note—that you must take into consideration the cost of doing the work year by year; the interest you have to pay on it; the sum you have to borrow the next year for doing the work and for paying the interest on the former work, and so you go on. In that way, with the schemes I was connected with, I certainly found that the compound interest mounted up to such an enormous sum that the cost of reclamation became, I will not say trifling, but it was small compared with that awful incubus of compound interest.

Q.—That was the reason why you were very anxious in those days to push on with the scheme?

A.—Certainly.

Mr. Billimoria.—Would the murum filling have been as expeditious as dredger filling?

A.—I should imagine not. I have had no actual experience, but I certainly think not, because, as I say, the murum filling would be done by the spadeful, and when you have an enormous area like 1,100 acres to fill in I think the only possible way of doing it is to get this enormous mass of material being passed in through these huge pipes coming across the island and delivering the clay on the other side.

Sir M. Visvesvaraya.—The question of cost comes in now. If it costs you less to do it by murum than by dredging, would you not recommend murum?

A.—I would.

Q.—You may be aware that they are doubling the lines on the G.I.P. and the B.B.C.I. They are working by electric power partly. Could not you get murum from both sides and get the quantity you would require?

A.—You would only get it in by the trainload, and when you have a huge area like that a trainload is a small thing.

Q.—We have calculated all that. Sir Frederick and I went to the Agents there and made enquiries, and we found it was quite possible to get the material as fast or faster than you would do it by dredging. There is one advantage in murum filling, namely, that you can reclaim land speedily, and will be in a position to dispose of it gradually. Both operations may go on side by side.

A.—When you are doing the work by murum filling, you can do the work to-day and sell it to-morrow.

Q.—So that your capital is not locked up?

A.—Quite so.

Q.—There is an enormous advantage in the saving of interest; the work comes out eventually cheaper, and as and when the demand comes you can dispose of the land and go ahead with the reclamation?

A.—I should say, if the reclamation becomes cheaper, that is a matter which can be calculated very easily. It is merely a matter of figures.

May I make one remark before I withdraw, Sir. In my note I said that the dredgers could not work efficiently in the sand of the Back Bay owing to the deposit of sand being so shallow. There was another reason which came into that. It is very exposed to the south-west monsoon, and the dredgers would have become very much knocked about. In fact, we could not have done the work in a monsoon. The other point I want to emphasise is this. In my note I said that we endeavoured to get public opinion expressed on this, and that public opinion was silent. I should like to say that Lord Sydenham, who was Governor of Bombay, was exceedingly anxious to have public opinion focussed on this great question. He did everything that a Governor could possibly do to get an expression of opinion.

Chairman.—What year are you speaking of?

A.—1910-11.

(*The Witness withdrew.*)

The Committee assembled at 11 a.m. on Thursday, the 30th September, 1926, all the Members being present.

43rd Witness, Sir Sydney D'Aguilar Crookshank, K.C.M.G., C.B., C.I.E., D.S.O., M.V.O., A.I.C.E.

Called and examined.

Witness.—You must understand that my connection dates back to the period between 1919 and 1923, so that I am speaking almost entirely from memory.

Chairman.—I quite understand that. I think your full name is Sydney D'Aguilar Crookshank?

A.—Yes.

Q.—You were Secretary to the Government of India Public Works Department at the time when you wrote your memorandum of November, 1919?

A.—That is correct. After the war I went back to India and was appointed Secretary in the P.W.D.

Q.—Sir Claude Hill was the Member in Charge?

A.—Yes, at that time.

Q.—It might be convenient for you to have your memorandum in front of you. (*Same handed to the Witness.*) You wrote this memorandum in the ordinary course of your office work and it would be circulated throughout the office?

A.—Throughout the Government of India Offices.

Q.—That was in relation to the reclamation scheme which at that moment was a great concern of the Government of Bombay?

A.—Yes.

Q.—This memorandum begins: "Public Works Department. It is a great pity that this Back Bay reclamation work should not have been taken in hand earlier as the value of the scheme for building purposes in the town of Bombay, and as a profitable financial undertaking, is immense and growing day by day." As regards building purposes the only relief that that reclamation would give would have been in the business area—at least the only direct relief?

A.—And the residential area.

Q.—The business and residential area?

A.—Yes, because at that time land was being sold in Bombay at a colossal rate. I remember that particularly because the Government of India had cause to make inquiries in connection with sites for certain houses they wished to erect. If my memory serves me aright the cost of those sites was so high that we had to give up all idea of providing residences for the officers we wished to see housed.

Q.—The advantage to the poorer classes of Bombay would have been from the profit which was expected to be derived?

A.—Yes, very largely. I presume the cost of land would have gone down generally as a result of the reclamation works and there would not have been the same acute situation as existed at that time.

Q.—The point I rather wanted to put to you was this. There was a criticism in the Legislative Council that this scheme was for the benefit of the classes as opposed to the benefit of the masses. The answer that was given was that the resulting profit could be used in any way for the amelioration of the poorer classes. That is not unreasonable?

A.—That is what I understood the situation to be. It was for the benefit of all. It was not for the benefit of the few rich people who might purchase sites in the reclamation area.

Q.—You continue : " No time should be lost in getting down to business. There is really only one scheme, which is that drawn up by Messrs. Lowther, Kidd & Company in 1912 and estimated to cost 325·23 lakhs." Taking the rupee at 1s. 6d, 325 lakhs represent £2,437,000. You may accept that from me?

A.—Yes.

Q.—" I consider this to have been a very carefully and ably prepared project, although there are points in it which call for reconsideration." That is a reference to what has been called the Kidd Report?

A.—Yes.

Q.—Had you any previous experience of reclamation upon an open sea front?

A.—None whatever.

Q.—Did you examine Mr. Kidd's figures given at page 9 of the Report?

A.—I examined the whole estimate very carefully indeed from such general experience as I had had, and the somewhat exceptional experience I had had in France as Director General of Transportation to the British Expeditionary Force where I had occasion to do a good deal of work in connection with the construction of docks, and my opinion was that this was an extremely good estimate. As I mentioned there, I had no occasion to criticise it, except in a few minor details which I am not prepared to go into now.

Q.—Do you think if that document had been submitted to half a dozen of the most eminent contractors in the world that they would have been able to tender upon it?

A.—I do.

Q.—" As regards the estimate, I have no occasion to pass any remarks upon it, and I do not attach any value to Sir George Buchanan's comparative estimate of 241·9 lakhs. It is useless to frame estimates now on might-have-been conditions in 1912 and, anyway, both these estimates are out of date." This memorandum of yours is being written on the 28th November, 1919?

A.—Yes.

Q.—The prices of materials such as were required here had risen, had they not, between 1912 and 1919 by three times?

A.—I would not say exactly that, but they had risen very largely, and that is what I base my remarks on.

Q.—We have got some figures here. Had they risen at least twice?

A.—Yes, to my knowledge they certainly had.

Q.—" Sir George now submits a revised estimate amounting to 367·6 lakhs." That is £2,760,000. Did you consider that the figure of Mr. Kidd as at 1912 was a reasonable one, 325 lakhs?

A.—I did.

Q.—Did it occur to you, therefore, that Sir George Buchanan's figure of 367 lakhs must have been far too low?

A.—I think you will find later on I suggest that some more should be added to it.

Q.—You do; you suggest 20 lakhs.

A.—I think it is a little more but I am not quite certain.

Q.—To be very precise it is 33 lakhs. You suggest bringing it up to 400 lakhs?

A.—Yes.

Q.—For loan purposes. But if the figure of 325 lakhs was a fair figure in 1912 the work could not possibly have been done in 1919 for less than 650 lakhs, could it?

A.—Well, the rise which you refer to was mainly on machinery.

Q.—Was not it on cement as well?

A.—Yes, but not on ordinary coolie work.

Q.—Rates of labour?

A.—I do not think the rise would have been as much as that during that period—at least that is the impression I gained.

Q.—We have the rise in the rates of labour and you may take it that coolie labour rose about 100 per cent. between 1912 and 1919?

A.—Yes.

Q.—And materials, you say, were at least twice as much?

A.—That is what I should reckon.

Q.—My suggestion to you is that they were three to four times as much?

A.—Yes.

Q.—I will put the question to you once again. If as you have told us you thought that 325 lakhs, that is £2,437,000, was a reasonable estimate of Mr. Kidd, how could Sir George Buchanan have done the work for anything less than 650 lakhs, or £5,000,000?

A.—Well, on the face of multiplying by 2 in one case and by 3 or more in another he could not.

Q.—I have only multiplied by 2. I have taken your own figure. Twice 325 is 650. How could Sir George Buchanan have done the work for anything less than 650 lakhs, roughly £5,000,000. He could not, could he?

A.—I can only say in reply to that that I went into his figures with him. He, of course, criticised Messrs. Kidd's figures for dredging and said they were excessive. On going through it with him, I came to the conclusion that this estimate of his of 367 lakhs, plus what I had added on myself, would be sufficient to work on.

Q.—Then you thought, on the 28th November, 1919, that the whole of the work as specified by Kidd could have been done for 400 lakhs?

A.—That is the view I held then as a result of going into the figures of Kidd's estimate and Buchanan's estimate.

Q.—That is £3,000,000?

A.—Yes.

Q. Had you seen Sir George Buchanan's report at this date. Sir George Buchanan's report is dated September, 1919, and was undoubtedly in the hands of Government in October, 1919. Had you seen his report?

A.—I imagine I had. I had it before me.

Q.—If you had been in consultation with him, it would be the basis of your discussion, would it not?

A.—Yes.

Q.—In contrasting the two, that is, the estimate of Mr. Kidd and of Sir George Buchanan, you point out: " The estimate differs from that of 1912 in that it provides for a heavier section of sea wall throughout the greater part of the whole length, on which point I am in entire agreement." One object of the sea wall was to retain whatever was pumped into the reclamation area, was it not?

A.—Yes.

Q.—Are you aware that some 46 per cent. of the material appears to have escaped through the sea wall?

A.—I am not up to date in the matter in any way. I did not suppose that it would, because I presumed that they would construct the wall in such a way that it did not.

Q.—But in all these matters you must have been to a very large extent in Sir George Buchanan's hands?

A.—In that I had no personal experience on a large scale of any work of that nature, I admit that I was.

Q.—You do make a suggestion with regard to the dredger in which you say: " I cannot pronounce on the design or cost of the proposed dredger, and I am not in a position to question Messrs. Simons' merit and the figures. In a case of this sort I should prefer, before coming to a decision, to refer to Sir Alexander Gibb and also perhaps to Sir Ernest Moir and Sir Brodie Henderson in a consulting capacity." You will not object if I say that that was a very prudent suggestion. Your view, I take it, was that in a work of this magnitude you wanted some checks and some counter checks?

A.—If I had had the execution of the work in my own hands I would not have attempted it without getting opinions from specialists such as I have named.

Q.—Sir George Buchanan had put forward Messrs. Simons as builders of a dredger to a certain design?

A.—That was the position at the date of the interview, yes.

Q.—Were you unacquainted with rotary cutter suction dredgers?

A.—I was.

Q.—Whatever may have been the eminence and position of Sir George Buchanan and the eminence and position of Messrs. Simons, you thought it prudent to have the advice of one or more specialists in the matter?

A.—I went further than that. I was not prepared to accept their opinions as final.

Q.—Would this note of yours have gone to the Government of Bombay?

A.—No.

Q.—It would not.

A.—No.

Q.—" The engineering features are by no means difficult or doubtful." You had to accept that, of course, from Sir George Buchanan?

A.—Yes, together with such general experience as I had myself.

Q.—" And the whole project really hinges on the efficiency of the dredger." Did it?

A.—Well, in my opinion it hinged on the success or failure of the dredger, as far as one could see from the two reports which I had before be at the time—apart from the organisation and administration.

Q.—Were you aware that Sir George Buchanan was proposing to dredge 30,000,000 cubic yards of material that was the property of the Port Trust?

A.—That is a point I am afraid I did not take into consideration. I had Messrs. Kidd's statement before me that there was plenty of material there, as taken from their borings, of which they took 1,000 or so, and I had to go, as Secretary, on the fact that an examination had been made locally and the necessary inquiries instituted and whatever arrangements were required had or would be made.

Q.—The first essential was to obtain the permission of the Port Trust, in whom the bed of the ocean was vested by Statute?

A.—Yes. You understand that was rather outside my scope and activities as Technical Secretary.

Q.—Let us come back to this report again: " The whole project really hinges on the efficiency of the dredger." Did not the whole project really hinge upon the question whether there was enough material in quantity and quality to provide spoil for the filling in?

A.—Well, that would be wrapped up in the efficiency of the dredger as a whole.

Q.—Surely not. Surely they are quite distinct?

A.—Well, in a way.

Q.—However efficient a dredger is, it cannot dredge unless it has got material to dredge?

A.—No, but then I had to take it more or less for granted that the material was there and available.

Q.—Did you really have to take it for granted. You were advising the Government of India, were you not?

A.—Yes.

Q.—Did you notice a very significant phrase in Mr. Kidd's report on this? Would you just turn to page 2, paragraph 6, of his report. " A system of borings by hydraulic tubes was devised." Does not that strike you as a very singular phrase?

A.—You mean as throwing some doubt?

Q.—As suggesting that Mr. Kidd improvised some appliance, which I agree he says was successful, to ascertain the depth of the material forming the bed of the sea?

A.—Yes.

Q.—It is a very curious phrase, is it not?

A.—It is, but then he goes on to say that he made so many borings and they had all been sunk to a hard bottom.

Q.—He goes on to say, " which proved to be perfectly reliable as well as rapid in action "?

A.—Yes.

Q.—In November, 1919, were you familiar with the ordinary method of ascertaining what lies below the bed of the sea?

A.—No.

Q.—But I suppose you know that at a depth such as 35 feet of water it is just as simple to ascertain what is the nature and extent of the material at the bed of the sea as it is to ascertain it on dry land?

A.—Yes, but I wish to explain that I looked upon it in this way. I had before me a statement from Messrs. Kidd, whose report I considered to be of immense value. I considered that that statement had only been made after suitable investigation and presumably after consultation with the local harbour authorities, and that, therefore, as far as the material required was concerned, it was good enough to go on. Thereafter I stated in that note that the project hinged on the dredger. I had in my mind in making the statement first of all the efficiency of the dredger as a mechanical appliance, and, secondly, that before any work was undertaken or the dredger had been provided, a guarantee would have been obtained that this material was available and would be produced by the dredger and the pumps.

Q.—But where in your memorandum is there any suggestion that a guarantee would be obtained as to the sufficiency of the material?

A.—That would go with the efficiency of the dredger.

Q.—I am endeavouring to point out to you that the efficiency of the dredger is a totally different thing from the existence of material. Do not you agree?

A.—Well, it does and it does not, if you look at it from my point of view. My point of view is, that if you are placing an order for a dredger you would get a guarantee through the suppliers of the dredger that it was thoroughly reliable and efficient, and probably you would make them work it for about a year to see that it was. Therefore, it would be up to them to send representatives out and make necessary investigations on the spot before they gave this guarantee. As engineer in charge, that is the way I would have done it.

Q.—But, surely, you are not suggesting that Messrs. Simons would give any guarantee as to what the bed of the sea consisted of?

A.—I consider that before an order was placed with them or any other firm of dredger builders some guarantee should have been given that they themselves had satisfied themselves that the stuff was there, and that their dredger would carry out the job.

Q.—That a dredger-building firm on the Clyde should go to Bombay and take core borings or shell-auger borings to ascertain that their dredger would do the work?

A.—They certainly ought to have sent a representative to Bombay.

Q.—Surely, not. Is not it the duty of the man who is going to undertake the reclamation scheme to satisfy himself, first of all, that there exists in that harbour sufficient material to be placed in the reclamation? Is it not the duty of Sir George Buchanan and not that of the dredger builders?

A.—I consider it the duty of Sir George Buchanan, but I also consider it the duty of the dredger people to make sure before they supply the dredger that all the conditions are favourable.

Q.—What happened was that Messrs. Simons were told that a rotary cutter suction dredger was wanted to cut soft clay at a rate of 2,000 cubic yards per hour.

A.—Yes.

Q.—And on that they built their dredger?

A.—Yes.

Q.—But, surely, you cannot suggest that they were under any duty to go to Bombay to ascertain if the stuff was there?

A.—Not as you put it now; but if they had been required to give a guarantee, I think in their own interests they would have sent somebody out to find out what the conditions were. They could not have given a guarantee without satisfying themselves on that point, could they?

Q.—Not if the guarantee were to dredge 2,000 cubic yards an hour in Bombay harbour. But that was not the bargain. The bargain was a dredger capable of dredging 2,000 cubic yards of soft clay per hour, trials on the Clyde. That was the bargain.

A.—In that case they had no occasion to take any further interest in what happened at Bombay.

Q.—Exactly, and, therefore, the sole responsibility for the existence or non-existence of dredgeable material in 1919 rested on those undertaking the reclamation?

A.—Exactly; based on Messrs. Lowther and Kidd's report that the material was there.

Q.—I agree. Did you have any conversation with Sir George Buchanan as to whether he was quite certain about the quality and quantity of the dredgeable material?

A.—That I cannot remember; but, generally speaking, I have carried away the opinion that the local conditions were favourable.

Q.—At paragraph 4 of your Report you say: "I understand that Sir George Buchanan, on behalf of his firm, offers to undertake his supervision at 2 per cent. on

the expenditure. I do not recommend the acceptance of this proposal." In point of fact, that proposal was eventually accepted?

A.—Yes.

Q.—But you had advised against it?

A.—Yes.

Q.—" And I consider that the work should be wholly done by the Bombay Government, and a special staff should be entertained." I do not quite know what that means. " Entertained," probably, is not the word?

A.—It is probably " appointed."

Q.—" A special staff should be appointed for the purpose, at the head of which I have in mind a docks' engineer who, by reason of his ability and experience, stands out prominently for selection." Then you made a suggestion that a certain very eminent gentleman should be put at the head of the whole matter?

A.—Yes.

Q.—" And that with the assistance of selected Public Works Department engineers and subordinates the whole project may be safely placed in his hands to be carried out "?

A.—Yes.

Q.—That was not accepted?

A.—Well, you will see that, arising out of my note, both my recommendations were not taken into consideration.

Q.—The firm of Messrs. Meik and Buchanan was appointed as the actually responsible engineers to the work, but at this date, the 28th November, 1919, you were dealing with Sir George Buchanan alone?

A.—That is right.

Q.—Now I come to another point. I want you to take in your hand the document called " History of the Scheme," and I am referring to page 9, line 14. The point is this: We are a little in doubt as to the manner in which Sir George Buchanan was employed and as to the original arrangement to employ him. You see there it says: " A telegram was sent by this Government." " This Government " means the Bombay Government, so that that should read: " A telegram was sent by the Government of Bombay to the Secretary of State on the 26th May, 1919." I need not read all that. There is a reference to the difficulty of getting Mr. Palmer. Mr. Palmer was a gentleman in the firm of Palmer, Rendall and Tritton: " My Government . . . in view of the difficulty of getting Palmer out before October decided to employ Buchanan, who is at present engaged upon the work, and will probably, after concluding a preliminary investigation, proceed home to make further enquiries regarding dredging plant and material." That telegram was dated the 26th May, 1919. That is some five or six months before your note of November?

A.—Yes; I was in France at the time.

Q.—Do you happen to know whether the Government of Bombay had consulted the Government of India as to whether Sir George Buchanan should be employed?

A.—No.

Q.—You see how it reads?

A.—They had apparently made up their minds at that early stage.

Q.—It reads as an accomplished fact, does not it?

A.—Yes.

Q.—" My Government decided to employ Buchanan, who is at present engaged upon the work." Therefore, the decision to employ him was antecedent to the 26th May, 1919, the date of the telegram?

A.—Yes.

Q.—You cannot help us at all as to whether the Government of Bombay had any communication with the Government of India saying that they proposed to employ Sir George Buchanan, and enquiring if he would be acceptable to them?

A.—No; I have no information as to that. I can only surmise that Sir Claude Hill, who was my principal at the time, and was himself a Bombay official, was in constant communication with the Government of Bombay, as he was very interested in this project; and he may, if he did not suggest the employment of Sir George Buchanan, have known that he would be consulted and employed, or, at any rate, consulted. At the time I was Secretary, P.W.D., Sir Claude Hill himself, I remember, went down to Bombay and went into the matter of this project with Sir George Lloyd.

Q.—Was Sir Claude Hill in any sense an engineering expert?

A.—No; but he obviously had been in communication with the Government of Bombay about their ideas and proposals in the matter.

Q.—Undoubtedly.

A.—That is before I came on the scene.

Q.—As to the interview in November, that would be at Delhi, the interview of the 28th November?

A.—Yes; that would be in Delhi.

Q.—At this interview with Sir George Buchanan, and before you wrote your memorandum, did you have anybody else there in consultation with you—any Public Works Department official?

A.—No.

Q.—Or any engineering expert?

A.—No. If my memory serves me aright, Sir George Buchanan came up to Simla very shortly after I took up my appointment, and I talked it over with him before the Government of India went down to Delhi.

Q.—Simla would be in the summer time. What time was it?

A.—No; that was quite late in October.

Q.—Just before you would go down?

A.—Just before I wrote that note, I think. There is one point I would like to make clear, and that is in connection with the design and ordering of this dredger. I personally withdrew all responsibility.

Q.—It is quite obvious that that is so, because you say: "I cannot pronounce on the design or cost of the proposed dredger, and I am not in a position to question Messrs. Simons' merit and figures," and then you suggest that other experts' advice should be taken. That is quite clear.

A.—Yes; but later on I went further than that, and I said I wished entirely to dissociate myself from the purpose of the dredger.

Q.—Is that some memorandum?

A.—It is in writing on the file.

Q.—I am afraid we have not got it. Do you remember about what time that would be?

A.—It may be about a month afterwards. Before proceeding any further, there is one point which I want to make perfectly clear, and that is that the specific recommendations which I made in my memo. as to the examination of the project by consulting specialists, and to the organisation for the execution of the works, were not taken into consideration.

The Chairman nodded assent.

Sir M. Visvesvaraya.—In what years were you Secretary to the Government?

A.—From about towards the end of October, 1919, to June, 1923; latterly, as the Secretary to the Government of India had been abolished, I was consulting engineer to the Government of India.

Q.—In 1923?

A.—Yes, from May, 1923, to July, 1923.

Q.—You are aware that the original estimate was for 367 lakhs, and it was increased to 400 lakhs?

Q.—The Government of Bombay themselves recommended putting the figure at 400 lakhs.

A.—That was my suggestion that, roughly speaking, it should be taken as a 400-lakh project.

Q.—Was this addition made by you or by Sir George Buchanan, because the Government of Bombay themselves have written to the Government of India to the effect that the cost should be taken at 400 lakhs?

A.—I made that addition to Sir George Buchanan's estimate after I had been through the project with him, and entirely on my own.

Q.—Was it before the Government of India had addressed their official letter on the subject?

A.—I think it was before the despatch went to the Secretary of State.

Q.—In the despatch to the Secretary of State you said: "With the addition of 10 per cent. the estimated cost of the work is, roughly, four crores, and we are satisfied that the work can be carried out for this sum."

A.—Yes.

Q.—There was a similar statement in the Government of Bombay's letter addressed to you previously. I suppose you have not followed the subsequent fortunes of this scheme since 1923?

A.—I have followed them to a certain extent, but in no way in a sense of responsibility.

Q.—From a professional interest in the scheme?

A.—That is right.

Q.—It went up to 702 lakhs by revision?

A.—Yes; I understand that is the case.

Q.—And you will probably take it from me it is now estimated to cost 1,000 lakhs or 10 crores?

A.—Yes.

Chairman.—1,000 lakhs, with the rupee at 1s. 6d., is £7,500,000.

A.—Yes.

Sir M. Visvesvaraya.—Do you, as an engineer, know that had the reclamation been done by dry-filling the cost would have been between four and five crores?

A.—I had no occasion to take out any figures for that.

Q.—If they had not committed themselves to the dredging proposition before the estimate was sanctioned, dry-filling would have been cheaper?

A.—Had I been engineer-in-charge I should have placed more reliance on dry-filling myself.

Q.—That is a very important statement. The original estimate was for 367 lakhs. If the Government of India and the Secretary of State had known that it was likely to be materially exceeded, and if they had had before them a dry-filling estimate, they certainly would have preferred the dry-filling estimate on the figures?

A.—You cannot say that. I have no doubt if the estimate for dry-filling had been about the same, or cheaper, they would naturally have said: "What is the good of spending £600,000 on the dredger?".

Q.—That is an important point. The estimate was for 367 lakhs. As such it was justified for a dredging proposition?

A.—Yes, it seemed to be quite a good proposition.

Q.—That estimate was sanctioned; and then they committed themselves to the dredger proposal?

A.—Yes.

Q.—Then they could not change afterwards, so the result was they went in for a 702-lakhs estimate, while the work could have been done for about five crores?

A.—We have no evidence to that effect.

Chairman.—We have no evidence to the effect that the work could be done for five crores, because nobody on earth can tell us where the dry-filling is to come from. I want that fact kept very prominently before you.

A.—It would have had to come in by train.

Q.—Where is the dredging face?

A.—Any way, no alternative estimate was framed as to the cost of dry-filling at the time.

Q.—That is the real answer. The only proposition you were considering was a dredging proposition?

A.—Yes.

Sir M. Visvesvaraya.—The Chairman may not be aware that Mr. Elgee has himself deposed that with five crores you can get the work done by murum filling. As regards the question whether murum is available, Sir Frederick Hopkinson and myself went to the Railway Officers and we found that murum can be got cheaper in the neighbourhood.

Chairman.—I have read the evidence, but there is nothing in the evidence of that.

Sir M. Visvesvaraya.—It is in the report of Mr. Elgee's evidence. At present the estimate comes to 10 crores. What do you think, speaking as an engineer, must have happened to bring about such a great change?

A.—That is rather a difficult question.

Q.—I understand you have followed in an academic way the fortunes of the work. Could you tell us roughly what you think must have happened? It is rather extraordinary, is it not, that an estimate of 367 lakhs should have gone up to 1,000 lakhs?

A.—It must have been obvious from the first that the dredger was a failure.

Q.—You think it is the failure of the dredger?

A.—The failure to work up to its estimated capacity.

Q.—And other circumstances, of course?

A.—I do not see why other circumstances should have affected the situation very seriously. Of course the cost of labour may have gone up in Bombay. As I pointed out in my note, the whole thing hinged on the dredger. Unless the dredger functioned to its full capacity, you could not expect the work to be carried out at the original estimate.

Q.—You think that the excess over the original estimate was partly due to the dredger having failed to give the output?

A.—Yes.

Q.—The Government of India were originally opposed to the project. Till 1917 they were opposed to any reclamation project; but changed their opinion in about 1919. Previously they had turned down such proposals two or three times?

A.—It would not have been from an engineering point of view, I think. Possibly the financial situation would not have been sufficiently satisfactory to embark on such a project.

Q.—Here is a letter from the Bombay Government. It is dated the 4th December, 1919, which reads: "I am to add that the Governor in Council is prepared, in view of the possible increase of rates for labour or materials, to add 10 per cent. to the total of the scheme as estimated by Sir George Buchanan; and the total cost of the project must be roughly taken as four crores for the purposes of finance." They may have done that after your memorandum?

A.—That is right.

Q.—Within a month of your memorandum they wrote to the Government of India in these terms?

A.—Yes.

Q.—What was the ground for this change of opinion on the part of the Government of India? The world conditions remained unsettled. This was a very huge scheme, and they were uncertain about working it within the estimate, for prices had gone up. On what ground did the Government of India change their opinion in such a short time?

A.—I should imagine—I cannot say from any knowledge of the facts—that the reason why the Government of India backed up the project in the way they did was because of the congestion in Bombay at the time, and the necessity for expansion.

Q.—And the high rates for land?

A.—The very high rates which obtained for land at that time; but I think the congestion might be said to be the chief reason.

Q.—In any case, they abandoned their usual attitude of caution on this question?

A.—I do not think you can altogether say that. I think they exercised a certain amount of control over the project up to a certain point.

Q.—The Member in Charge was Sir Claude Hill?

A.—Yes.

Q.—He was a Bombay civilian?

A.—Yes.

Q.—And he knew all about conditions in Bombay?

A.—Yes.

Q.—Having been a Member of the Government of Bombay himself?

A.—Yes, he knew Bombay inside out.

Q.—I take it he helped to push the scheme?

A.—Yes, he was very keen. He was helping Sir George Lloyd to get on with the job.

Q.—The Chairman asked you a question about who recommended the appointment of Sir George Buchanan. You said that it was the Bombay Government themselves, and that the Government of India had nothing to do with it?

A.—I do not think the Government of India had anything to do with it.

Mr. Billimoria.—In a telegram it has been suggested that it was at the instance of the Government of India that Sir George Buchanan was appointed?

A.—I do not know what that is based on—I can only think Sir Claude Hill suggested it.

Mr. Billimoria.—There is a telegram from the Secretary of State to the Government of Bombay in which it is stated "with the approval of the Government of India Sir George Buchanan has been appointed." It is stated also in Mr. Cowasji's evidence.

Sir M. Visvesvaraya.—Did the Government of India accept the four-crore scheme as a final one—as a detailed estimate, or was it put forward as an approximate one?

A.—You could not call it a final estimate, because there was not any very great detail to go on; but it was an estimate which they were perfectly justified in accepting.

Q.—It was also stated by the Government that the cost at the outside would go up to four crores?

A.—At that time.

Q.—You accepted that statement at that time?

A.—Yes, at that time.

Q.—Did the Government of Bombay report to the Government of India when the estimate was raised to 702 lakhs in 1922?

A.—I am afraid my memory does not serve me sufficiently well to give you any information on that subject. As a matter of fact, at that period it had gone out of the hands of the Public Works Department.

Q.—The Public Works Department was abolished?

A.—Well, the work was a reserved subject under the Government of Bombay, The Government of India had practically nothing to do with it.

Q.— But you did not expect any report from the Government of Bombay that the estimate had been considerably exceeded?

A.—I consider that if the Government of Bombay saw that the work was not proceeding satisfactorily, or that the estimate was likely to be exceeded, it was their business to inform the Government of India immediately.

Q.—They do not seem to have done this?

A.—No. Of course they were not obliged to do it under the constitution.

Sir Frederick Hopkinson.—I think they were, because the Government of India had to find the money. I had a long discussion in Bombay on this very point. The Government of India was finding the money for this, and therefore they must be in control.

A.—But they were not.

Q.—They must be, otherwise they would not find the money. They would not go on finding the money *ad libitum*?

A.—No; but anyway I was not in control, otherwise I should very soon have found out the state of affairs.

Q.—I am speaking of the Government of India?

A.—Yes.

Sir M. Visvesvaraya.—Was it right that the Government of Bombay should have relied upon one expert for an opinion on this scheme before they recommended it? Was it safe?

A.—In a case like this, the practice would be that you would appoint your consulting engineers to the work, and thereafter you must accept their technical responsibility.

Q.—Come what may?

A.—It is very difficult to introduce any overhead technical examination or supervision, unless you did what I consider should have been done in this case, namely, that an Advisory Committee should have been put over the directorate, which would have had the right to examine the work.

Q.—Before a huge scheme of this magnitude was sanctioned, would it not have been proper to consult a committee of engineers?

A.—That is what I myself recommended.

Q.—You recommended it at the time?

A.—Yes. In that note of mine I made it quite clear that I would not be prepared to accept——

Q.—Was your idea not accepted by the Government of India or by the Government of Bombay?

A.—It was not accepted by the Government of India. It did not go to the Government of Bombay.

Q.—The despatch was addressed to the Secretary of State by the Government of India on the 15th April, 1920. That was the despatch recommending the scheme?

A.—That is the 400-lakh scheme, yes.

Q.—I suppose you subscribe to the opinions expressed in that despatch as a whole?

A.—In that despatch do you mean? I wrote most of it myself.

Q.—But even if you wrote it, it had to carry the opinion of the Member?

A.—Yes. It had to go to the Member, and all round the Executive Council.

Q.—You say, " We are convinced that not only is the project one that presents no serious engineering difficulties, but that it can be effected at a cost which will be more than recovered by the amount received by the local Government from the sale of land not required by them for the erection of Government buildings, the provision of roads, paths, etc., which will be necessary in connection with the town plan lay-out of the area." " These estimates "—that is, Sir George Buchanan's estimates—" may, we consider, be accepted as a reliable forecast of the probable expenditure." Finally, " The work is one which, in our opinion, should be carried out with the least possible delay. It is essential for the development of the City of Bombay, and we are fully satisfied that it is a highly remunerative undertaking." You were apparently satisfied with the technical details?

A.—Absolutely.

Q.—And you were the Technical Adviser of the Government of India at the time?

A.—Yes, I was.

Q.—You were also satisfied with the financial aspect of the scheme as it presented itself to you?

A.—As far as I was concerned.

Q.—You stated that you did not know whether there was suitable material in the harbour or not, and that you accepted the opinion of the engineers on that?

A.—I accepted the report furnished by Messrs. Lowther & Kidd.

Q.—In such cases is it usual to accept the views of a single firm of engineers?

A.—I thought I was justified in accepting them. They apparently went to a lot of trouble to find out themselves.

Q.—With regard to the guarantee for the proper working of the dredger, you consider that the dredger builders should have been asked to give tests on the site?

A.—That point had nothing to do with me, of course, but I can only say that had I been the engineer-in-charge I should have insisted on a guarantee of the efficiency of the dredger to perform the task which was required in that particular locality.

Q.—Particularly as a previous dredger of the same size had been ordered on such conditions?

A.—I do not think it was as big as this one.

Q.—It was also giving 2,000 cubic yards?

A.—It was not such a big lift, was it?

Q.—About 30 feet or so. This is a bigger proposition, no doubt, but the quantity to be pumped was about the same in both cases?

A.—Yes.

Q.—It was a mistake not to have asked for a guarantee to test the dredger at site?

A.—I can only give my own view as an engineer, and that is that I would not have ordered it without such a guarantee.

Chairman.—Do you mean a guarantee that they would bring it out and do the work in Bombay?

A.—Yes. To take a parallel case, I have occasion now, as Chief Engineer of the Southern Command, to place orders for big electrical installations and I always insist that the firms shall instal them *in situ* and work them to my satisfaction.

Sir M. Visvesvaraya.—Do you think it was safe that the Public Works Department should have been excluded in the supervision of the scheme? The Government have created a new department. You approved of it I dare say?

A.—No, I had nothing to do with that.

Q—They created a new department, and all the traditions and practices of the P.W.D. were rejected?

A.—That was against my recommendation.

Q.—Do you not think the engineers of the P.W.D. could have assisted in working out this project?

A.—They would not have been capable of taking charge of it.

Q.—No, they would have wanted an expert to guide them.

A.—I recommended that an expert should be put in charge.

Q.—You want an expert who has had experience of reclamation work; that is all. Under the guidance of such an expert the engineers of the P.W.D. could have carried out the work?

A.—Either by contract or by departmental labour—preferably by contract.

Q.—As a matter of fact, you will be surprised to learn that many of the engineers appointed—almost all of them—were outsiders?

A.—One of them was the man who took my place at Delhi when I went to the war —Mr. Lewis.

Q.—They were all from outside the regular Public Works Department?

A.—They did not belong to the Bombay Public Works Department.

Sir Frederick Hopkinson.—Mr. Lewis was a Public Works Department man.

A.—He was a Burma P.W.D. man.

Sir M. Visvesvaraya.—Have you any suggestions to make for the future for improveing the works in the present condition of the scheme?

Chairman.—Do you know enough about it?

A.—I do not know enough about it. It all depends what organisation is going to carry it to completion. I could not make any statement which would be of any value.

Sir M. Visvesvaraya.—I only wanted your general opinion.

Chairman.—I do not know that we really want that. Unless this gentleman knows enough about it to give us some valuable technical advice, we had better not take rough general ideas. It is our business to pronounce on that.

Sir M. Visvesvaraya.—True, but we have not had many professional witnesses. This gentleman is a professional man, and I would like to put the question: " These are the facts. Judging from these facts what is your general opinion as to the future conduct of the works, if you have any opinion "? Of course if he has none to give he will say so.

Sir Frederick Hopkinson.—We want facts.

Sir M. Visvesvaraya.—Many engineers could give a general opinion on the facts laid before them.

Chairman (To the Witness).—Do you wish to risk giving a general opinion on the information which you have?

A.—I am afraid my information is not up-to-date, and therefore my opinion would not be of value.

Sir Frederick Hopkinson.—May I take it that your position at Simla was that of technical watch-dog for the Government of India on all technical matters connected with such schemes as this?

A.—Yes. They went through my hands as the Technical Secretary to the Government of India.

Q.—They would not have been accepted by the Government until they had passed your scrutiny?

A.—No. If I had reported adversely on any project it would have been referred back to the Provincial Government.

Q.—So that you are in a sense responsible for Sir George Buchanan's estimate, in as much as you accepted it?

A.—Yes.

Q.—And you advised the Government of India that it was accepted by you?

A.—Yes.

Q.—You said just now that you went through Sir George Buchanan's figures, especially those of dredging. He showed you details of how he arrived at his price, and you were satisfied?

A.—Yes, I was.

Q.—Do you remember what the price was? You will see it in the report. It is eight annas a cubic yard.

A.—Yes. He had talked about six annas a cubic yard, but I talked it out with him, and we came to the conclusion that six annas was not enough.

Q.—He suggested six annas for the dredging, did he? That is the total cost, including plant. You will see it on Page 29 of his report. He has got eight annas there?

A.—Yes, that is it.

Q.—Do you remember what proportion of that was the cost of the plant?

A.—No, I cannot say at this late date.

Q.—I suppose at that interview he did not tell you that the plant was going to cost eight annas a cubic yard?

A.—The plant?

Q.—Yes, the plant alone?

A.—No, certainly not.

Q.—That is what it has cost?

A.—Well, apparently the cost of the plant was hideous.

Q.—Therefore, according to his estimate, you would have to do the dredging for nothing to bring it within his estimate?

A.—Yes. That is news to me.

Q.—It is, however, the fact. You said that you considered Mr. Kidd's estimate a reliable one in 1912?

A.—His scheme generally. I thought it was an extremely good one.

Q.—And the estimate?

A.—Yes.

Q.—And you thought that possibly prices may have doubled between then and 1919?

A.—The prices of plant. I am speaking entirely from memory. I was not aware that the prices of coolie labour had doubled, but I gather from you that they had.

Q.—I will not say exactly by 1919, but at the present time they are about double what they were in 1912. If the prices of plant had doubled, and Sir George Buchanan's estimate of the total cost of the work was $2\frac{3}{4}$ millions, the cost of the dredging plant and the other plant has been $1\frac{1}{4}$ millions?

A.—Yes.

Q.—Therefore, the cost of his plant has been nearly 50 per cent. of his total estimate?

A.—Yes.

Q.—From your experience would not you say that a contractor's ordinary charges for plant, profit and superintendence would be in the neighbourhood of 25 per cent.?

A.—His overhead charges?

Q.—Yes, including profit?

A.—I should say that was a low estimate. I should think it was nearer 30—well, 25 per cent., we will say.

Q.—25 to 30 per cent.?

A.—Yes.

Q.—Here, you see, the plant alone comes to 50 per cent. Really it is nearly 100 per cent. on the cost, is it not?

A.—Yes.

Q.—Therefore, I suggest that somebody ought to have seen that the estimate was most unreliable?

A.—At that time?

Q.—At that time.

A.—I did not consider it was unreliable at that time. It subsequently proved to be.

Q.—Shall we go into the details of the cost of the rise in values or cost of machinery from 1912 to 1919? These are things that would be used generally throughout the works, and would, of course, influence the total cost. Coal, for instance, was 12*s*. 6*d*. a ton in 1912, and it was 47*s*. 3*d*. a ton in 1919; that is, four times as much. Cement was £1·58 per ton in 1912, and it was £5·32 in 1919. Iron bars, which we may take as an idea of the price of material put into machinery, were £8·75 a ton in 1912, and £22·43 a ton in 1919. Ship and boiler plates were £8·46 a ton in 1912, and £18·34 in 1919. Locomotives were practically double—£54 as against £96. From that, I suggest to you that the 1912 prices ought to have been very nearly trebled?

A.—According to those detailed figures, probably yes.

Q.—Surely the Government of India knows the prices of ordinary commercial goods, and the Government of India should know these prices when they pass an estimate like Sir George Buchanan's.

A.—I was perfectly well aware of the general increase of costs of engineering materials and plant, but I went into this project with Sir George Buchanan, and we discussed it. My deputy also discussed it, and we came to the conclusion that the estimate of his of 400 lakhs, as I made it out——

Q.—His estimate was 367 lakhs?

A.—Yes, 367 lakhs, and that that, combined with what I added, would be sufficient to carry out the work.

Q.—If your plant is going to cost you the total sum which you have in for dredging, it seems ridiculous.

A.—Yes. How was I to know the plant was going to cost that.

Q.—Surely you would inquire. £600,000 would come to about six annas a cubic yard?

A.—Yes, but I do not remember the whole facts of the case. I do not think £600,000 was the original estimate for the dredger.

Chairman.—You get the figures in Sir George Buchanan's report. If you look at the beginning of Page 17 you will see how they work out. It is over £600,000, I think.

Sir Frederick Hopkinson.— His estimate given on Page 17 is £499,000.

Chairman.—Then at Page 19 you get £549,000 under certain conditions.

Witness.—Whereas, actually it cost £600,000.

Sir Frederick Hopkinson.—No, the dredging plant altogether cost £855,000.

A.—The dredger cost £600,000, did it not?

Q.—Not one dredger. The whole dredging plant cost £855,000, and during the construction of the work there was a proposal to buy yet another dredger costing £192,000. I still cannot understand how you, in the position in which you were at Simla, could possibly have passed an estimate of 367 lakhs which had been estimated to cost 325 lakhs in 1912.

A.—I am speaking from memory, but I think the reason was that Messrs. Kidd estimated somewhere about 9½ annas. Sir George Buchanan got it down to about eight annas, and I considered it ought to be eight annas.

Q.—Your price for the dredging was less in 1919 than Mr. Kidd's was in 1912; and, as we know, the prices of all machinery and things necessary for carrying on such work had trebled in the meantime?

A.—Well, Sir George Buchanan queried that rate of nine annas three pice, and worked it down to six annas.

Q.—You induced him to put it up to eight annas?

A.—Then he put it up to eight annas. As a matter of fact, the first estimate was only 312 lakhs, was it not?

Q.—No. He made an estimate based on 1919 as a comparison with 1912, and you said that was no good?

A.—I said it was no good talking about it at that time, but he said that Mr. Kidd had overestimated.

Q.—But you did not think so. You thought that Mr. Kidd's estimate was a proper estimate?

A.—I considered that, by comparison with his estimate and Kidd's estimate, that *this* estimate was a suitable estimate on which we could proceed.

Sir Frederick Hopkinson.—But you say of Mr. Kidd's estimate: "I consider this to have been a very carefully and ably prepared project." Project, of course, includes the estimate, does it not?

Chairman.—You told me, Sir Sydney—and I put the question very carefully to you—that you approved of Mr. Kidd's price of 325 lakhs.

Sir Frederick Hopkinson.—That is what I am going on.

Witness.—I approved of the project entirely, but I naturally listened to what Buchanan had to say about this rate of nine annas three pice, which he said was excessive. On that I considered that the rate given here of eight annas, eventually working it up to 400 lakhs, was suitable, and as such I recommended it to the Government of India.

Q.—Had you known that the prices of everything to be used in connection with this work would have been trebled, I presume you would not have agreed to the 367 lakhs?

A.—I am not altogether prepared to say so at all.

Q.—What? Knowing that the prices had been trebled?

A.—I knew they had been doubled.

Q.—Even knowing they were doubled, having approved of Mr. Kidd's estimate, would not you have thought it must be at least 650 lakhs?

A.—No, because I went into Mr. Kidd's estimate with Sir George Buchanan's 1919 estimate, and as a result of that examination I came to the conclusion that *this*, plus what I added, was correct. I cannot possibly go back on that, because I did it with a perfectly good intent, and I went into it very carefully and put it forward as an official recommendation.

Q.—What I am suggesting is that Sir George Buchanan's estimate was quite unreliable and that you, in your official capacity, assented to it?

A.—After going into it, yes. I was not prepared to consider at that time that it was unreliable. Subsequent events have certainly proved it is.

Q.—Having regard to the fact that you had previously thought Mr. Kidd's estimate of 325 lakhs in 1912 was a very proper one, you surely must have thought that 367 lakhs, when prices had trebled, could not possibly be a proper one?

A.—I cannot say anything further, except, as I say, I went into the thing, and that is the opinion I gave, and I stick to it.

Chairman.—May I ask one question on that. *This* is the document from which Sir Frederick was speaking, giving the figures for 1912 and 1919. If you had had that document alone before you, would you have believed that the work could have been done for anything under 650 lakhs?

A.—You mean with all that detail of every description.

Q.—All the details of the prices for the years between 1912 and 1919. Would not this document alone have shown you that if Mr. Kidd's estimate for 325 lakhs was a good estimate, Sir George Buchanan could not possibly have done it under 700 lakhs?

A.—I must say, on the fact of it, that it seems perfectly correct, but I admit I did not go into it in detail to the extent which is referred to there.

Sir Frederick Hopkinson.—We had a statement made to us in India that the work of the dredger which was done in December of one year could not be known to the Government until the following August. Do you think that is a reasonable way to watch the progress of such a work as this?

A.—I should say it was wholly wrong myself.

Q.—It has been given in evidence that the work done by the dredger was taken daily, and yet the Government of Bombay were informed that they could not get the

results until August of the following year, and they apparently acquiesced in that. Presumably Sir George Buchanan would have the same information. How could the Government of Bombay have any possible idea as to how the work was going on under those conditions?

A.—It could not, naturally. It all depends on what organisation is set up to supervise the work.

Q.—You said just now that preferably you would have liked to have seen this work carried out by contract?

A.—I would.

Q.—Do you think a contractor would put off until August the knowledge of what his staff were doing the previous December?

A.—I am quite certain he would not. If he did he would be bound to fail.

Q.—I think so, too. With regard to Mr. Kidd's phrase about the borings, did it ever occur to you that all those borings ought to be checked, or were you quite satisfied with them?

A.—I took those borings to be sufficiently good to work upon.

Q.—Have you ever heard of the term "wash" borings before?

A.—No.

Q.—You do not know anything about it?

A.—No. I do not pretend to.

Q.—Do you think there was sufficient information in Sir George Buchanan's 1919 report to put before a contractor to make a tender on?

A.—Yes. I cannot say to make a tender on; to make investigations on.

Q.—With regard to the dredging, you discriminate between the dredger and the dredging. In your report you said that the whole project really hinges on the efficiency of the dredger, and the Chairman also said that it hinged a great deal upon the material being there to dredge?

A.—Yes.

Q.—Would it not largely depend upon whether the dredger was designed and built to deal with the particular material which existed in Bombay?

A.—Naturally.

Q.—If you designed the dredger to work on soft clay, and you actually found hard clay, it would not be possible for the dredger to give an efficient output?

A.—You could not expect it to.

Q.—Therefore, it was all important that the person who designed the dredger should see for himself samples of the clay which was to be dredged?

A.—As I said before, I would go further and say that whoever designed the dredger ought actually to have sent a representative out to Bombay to find out for himself what he had to do.

Q.—As a matter of fact, the dredger is designed equally to do soft mud and soft clay. Actually, the clay is hard. I will be glad to have your opinion, as an engineer of experience, about *that* piece of clay. Would you call that soft clay? Test the weight of it to start with.

A.—It is very much stiffer than that got out of the tubes in London.

Q.—Tell by the weight of it.

A.—It is extraordinarily heavy clay.

Q.—Unusually heavy, and, therefore, hard?

A.—Very hard, indeed.

Q.—That is called soft clay in the contract for the dredger.

A.—It must have been very misleading to the firm.

Q.—But you will notice that in 1919, when you read through Sir George Buchanan's report, he calls it hard clay.

A.—He refers to two clays, does he not?

Q.—He refers to hard clay three times, I think.

A.—I think, in filling the compartments, he refers to lighter clay and then to heavier clay afterwards.

Q.—I do not know if there is any distinction between any of the clays there; I should say not, but *that* is a sample actually picked up on the reclamation and brought home by us. Having that fact before you—that the dredger was designed to dredge soft clay—and *that* being the actual clay to be dredged, is it any wonder to you that the dredger has failed to do it?

A.—None at all. I am surprised it has done what it has.

Q.—It is only fair to say that the bulk of the dredging done up to the present time has been mud.

A.—Of course, *that* sample is rather a different thing to what it is when you actually take it out of the sea.

Q.—Of course. That has been out of the water for a month, but you can tell the character of the clay from that?

A.—Yes.

Mr. Billimoria.—I take it that, besides being a Secretary to the Government of India, you were by profession an engineer, and as such were in a position to advise the Government about embarking on a scheme of this description?

A.—I am not a specialist, in this particular line of engineering. My experience consists of 32 years in the Indian Public Works Department, during which time I have done railways, bridges, roads, buildings, inundations, and all sorts of works, but I am not in any way a specialist in this particular branch of engineering. That is why I specifically stated in my note that I should like to have opinions from the leading specialists in England.

Q.—You are a civil engineer by profession?

A.—No. I am a Royal Engineer, but I happen to be an Associate of the Institution of Civil Engineers.

Q.—In the general branches of engineering, you have considerable experience?

A.—Yes; you might almost say an unusual experience.

Q.—May I ask how long you had known Sir George Buchanan?

A.—I had never met him before he came up to Simla at that time.

Q.—You had had no connection whatsoever with him before he came over there?

A.—None whatever. I had never even seen him.

Q.—Did you know his antecedents?—I knew of the work he had done in Rangoon, and I had heard about the advice he had given in Busra, but other than that I did not know anything about him.

Q.—In answer to a previous question, you suggested that the Government of India did not recommend Sir George Buchanan. I interposed and said that the Honourable Member for Bombay had produced a telegram, copy of which I am going to read to you. The telegram is dated the 8th April, 1919, and runs as follows. It is from the Governor to the Secretary of State: "I have consulted Sir Claude Hill who agrees with me in pressing you should send expert out at once who should arrive Bombay not later than the third week of May. Failing your ability to find expert in short time available, my Government would agree to using Sir George Buchanan, whose services would probably be available and whom the Government of India recommend. My telegram has been drafted in consultation with the Government of India, and is being communicated to them."

A.—As I said before, I think the Government of India referred to there was represented by Sir Claude Hill.

Q.—You had no knowledge of this telegram?

A.—I was in France at the time.

Q.—In 1919?

A.—In that month, yes.

Q.—You were closely associated with the scheme, or discussed it generally with Sir George Buchanan when he came over to Simla and Delhi for the purpose?

A.—Yes.

Q.—As an engineer of repute and with considerable experience of the Public Works Department, you considered that his report was a sound report?

A.—His report was mainly based on Mr. Kidd's report, and as such I considered there was nothing against it.

Q.—Since you make reference to Mr. Kidd's report, that takes us back to the period of 1911 to 1913—pre-war?

A.—Yes.

Q.—You know that the conditions existing in India pre-war were normal?

A.—Yes.

Q.—After the war prices went up considerably?

A.—Yes.

Q.—Having regard to that circumstance, did you think it prudent to accept a figure less than Mr. Kidd had anticipated in 1911 as the proper figure which Sir George Buchanan had taken for his estimate?

A.—I did not. I did not agree with Sir George Buchanan's figure, and therefore I put it up to 400 lakhs.

Q.—Did you consider 400 lakhs as sufficient?

A.—I did, most certainly, at the time.

Q.—Did you go carefully through his estimate?

A.—As far as it was possible to do so, but, as I said, I did not go into the details of every item.

Q.—May I ask you to turn your attention to page 19 of that report, where the estimate of 367 lakhs has been given. Do you find any item for " contingencies " provided for there?

A.—No, but I added that myself.

Q.—You added that to make it 400 lakhs?

A.—Yes.

Q.—I am talking of this 367 lakhs estimate.

A.—But I did not accept that estimate.

Q.—It is not unusual, with engineers of repute, when they submit estimates, to make a provision for " contingencies," usually of 5 to 10 per cent?

A.—It is allowed for here. There is 5 per cent. put in.

Q.—That 5 per cent. is engineering charges, which includes possibly remuneration, and so on. It is not for contingencies.

A.—It is, to a certain extent. At any rate, I did not accept that figure, and I put it up to 400 lakhs. That is my point.

Q.—Do you find any item with regard to storm-water drains included in that estimate, which is an item which we have now discovered is going to cost the Government of Bombay something like 70 to 80 lakhs of rupees? Is that item of storm-water drains included there?

A.—No.

Mr. Billimoria.—So that, on that basis, the estimate goes to the rocks; it is absolutely hopelessly wrong.

Chairman.—Let us get the figure; I have worked it out. The question that Mr Billimoria is putting to you is whether you noticed that there was no provision in the estimates for storm-water drains?

A.—No, there is no specific provision.

Chairman.—The exact figure is £482,000.

Mr. Billimoria.—An item of such a vast magnitude as that, not having been included in the estimate, you cannot say that the estimate is reliable, can you?

A.—I do not quite know what that figure for storm-water drains refers to. I know nothing about it. That particular item has arisen since I had any connection with it.

Q.—It is an item which is primarily important. Without storm-water drains the whole of Bombay would have been flooded. We would not have existed on that land had not storm-water drains been provided.

A.—I do not think you can say that at all.

Q.—That is what the expert engineers have stated.

A.—The point is this. You must also include the sewerage and the electric light mains, and various other engineering services.

Mr. Billimoria.—They are mentioned in the estimate.

Chairman.—There was an absolute necessity to put in storm-water drains in order to carry off, say, the eight inches of rainfall which you get from time to time in eight hours. All the witnesses have agreed that they were absolutely essential. They were in existence as part of the scheme by which Bombay was kept free from flooding. When this enclosure was decided upon, unless provision had been made for that storm water to be carried out to sea, the whole of Bombay would have been flooded?

A.—Yes, quite true.

Q.—That work was to cost, and will cost if the scheme goes through, £482,000, and it is omitted from Sir George Buchanan's estimate, and was not apparently noticed by you?

A.—It was not taken into account by me, no.

Mr. Billimoria.—There is another item to which I would like to invite your attention. In this estimate no provision has been made with regard to railway rolling stock and quarrying machinery. Was not that an important item? It has cost a lot of money to the Government to acquire land for quarries and other machinery.

Sir Frederick Hopkinson.—That would be included in the prices.

Mr. Billimoria.—It is not given in the detailed prices.

Sir Frederick Hopkinson.—But the prices would include plant, just as much as the dredging plant includes the plant.

Mr. Billimoria.—If you look at the tables you do not find it there.

Sir Frederick Hopkinson.—But it is included in the prices. The prices for work done include the provision of plant in all cases.

Mr. Billimoria.—If that be the case then I say the estimate is hopelessly wrong, even then.

Sir Frederick Hopkinson.—The dredging plant alone would cost as much as Sir George Buchanan estimated it would cost, including plant and all the labour of doing the work. The plant alone has cost as much as his estimate.

Mr. Billimoria.—That is what I want to bring out.

Sir Frederick Hopkinson.—That is clear.

Chairman.—We are all agreed about that.

Mr. Billimoria (to the Witness).—If you were to include the cost of quarries, railway rolling stock, and machinery, this estimate would be hopelessly wrong. That is not all provided for here.

A.—It is supposed to be included in the rates.

Mr. Billimoria.—It is supposed to be.

Sir Frederick Hopkinson.—The rates in Sir George Buchanan's estimate include all plant.

Mr. Billimoria.—I will take it from you that it is so.

Sir Frederick Hopkinson.—That is understood.

Mr. Billimoria.—Were you acquainted with the reports made by other experts like Messrs. Jacobs & Davis, well-known engineers, who were employed by the house of Tata, those reports being made just about the time when Mr. Kidd was employed on the borings? Did you ever come across those reports?

A.—Not that I can remember.

Q.—Were you ever told anything about them?

A.—I have no recollection.

Q.—In those reports it has been clearly pointed out by Jacobs & Davis that the figures of Mr. Kidd were very optimistic and that the Government cost figures were impossible. If Mr. Kidd's figures were impossible, Sir George Buchanan's figures were much more so?

A.—Yes.

Q.—In their report to Mr. Tata, Messrs. Jacobs & Davis called this a mad scheme and stated that Mr. Tata would have cause to congratulate himself on having been dissuaded from going into the thing, if it ever came off. Are you aware of all this.

A.—I do not remember being aware of it. In any case, people held various views.

Q.—This is an official document, Sir Sydney. It is a report of the Bombay Development Committee, published in 1914. Was it not ever brought to your notice as one of the chief officials of Government advising the Government about embarking on a scheme of this description?

A.—It very probably was; but I cannot say what value is to be attached to every statement which is made in a report like this.

Q.—If it was brought to your notice, it would be interesting for me to go through several pages and paragraphs which might convince you.

A.—That would be quite hopeless, because I do not remember a single word of it.

Q.—But before you recommended Sir George Buchanan's scheme, did you not give any consideration to the fact that engineers who had been employed prior to that had run down the scheme and had called it a mad scheme? Were you justified then, in spite of that note of warning, to go and pass the scheme and recommend it, just because Sir George Buchanan happened to talk it over with you?

A.—I do not see that I should be bound in any way to be influenced by any particular opinion expressed. I went into the project as a project, quite apart from what anybody else had said about it.

Q.—Did you consider that project financially sound?

A.—As a 400 lakh project, I considered it was perfectly sound.

Q.—Did you consider the other aspect of the situation—how long it would take for the disposal of the land that would be reclaimed?

A.—That is another matter altogether.

Q.—That is where the financial point comes in very particularly.

A.—That is also where the point of the efficiency of the dredger comes in, on which I was always sceptical.

Q.—Did you consider that part of the question—as to how long it would take for the disposal of the reclaimed area?

A.—I say that that is entirely dependent on the efficiency of the dredger.

Q.—You had official documents and reports before you from the Public Works Department in which they estimated that the reclaimed area of 973 acres would take from 43 to 58 years for disposal. That was in 1911—a report by Mr. Cameron. That is in the official papers on the Government of India file.

A.—I was not in any way concerned with the financial success of the venture. I was concerned with the engineering aspects.

Q.—If you are recommending an engineering proposition, surely finance is very closely allied to engineering, just to show whether the scheme is going to be a success or otherwise?

A.—It is dealt with in a different department of the Government of India.

Sir Frederick Hopkinson.—Is not the point this—that a scheme which looks sound to you as an experienced man at 400 lakhs, might be utterly unsound at 1,000 lakhs? You only considered the scheme as a 400 lakh scheme?

A.—Absolutely.

Q.—Had it been suggested to you that it was going to cost 1,000 lakhs, you would have gone much more critically into it?

A.—I should not have looked at it in quite the same light.

Mr. Billimoria.—Do you think if the scheme as it stands had been estimated at a figure of 702 lakhs you would have recommended the Government of India to embark upon it?

A.—I should have looked at it primarily from its engineering aspects, and given my opinion on that. If, on the face of it, it had been going to cost 700 lakhs of rupees, I should probably have said that it was not worth the candle.

Q.—That would have been your opinion?

A.—That is probably what I should have said.

Q.—So the Government of India were induced to recommend, and to approve of the scheme on the basis of the figure of 367 lakhs, increased to 400 lakhs at your suggestion owing to these contingencies being taken into account?

A.—At that price it was a reasonable proposition.

Q.—Anything over that, you would not have considered to have been a sound engineering or financial proposition?

A.—I cannot say that, but it alters the aspect so completely that it is not much good arguing about it.

Q.—You were the responsible head of Government who recommended the Government of India, and who advised the Government of India, as to whether they should accept any proposal of the Government of Bombay?

A.—I did so, and I recommended the 400-lakh project as a reasonable proposition.

Q.—I ask you whether, if the figure had been in excess of 400 lakhs, you would have equally recommended the Government of India to have approved of the scheme?

A.—I cannot give you a direct reply to a question like that, because it was not put to me at the time. I had to consider the case as it was presented to me, and, as such, I made my report and gave my opinion. If it had been a 700-lakh job, it would have been looked at from a totally different standpoint, and I do not think myself that I should have recommended it for a moment.

Q.—How long had you been connected with the Government of India after you recommended this scheme? How long were you with the Government of India?

A.—I had only recently gone out from the war, and had gone up to join my appointment at that time.

Q.—But since 1919 you were continuously with the Government of India, were you?

A.—I have been with the Government of India since 1891.

Q.—I am talking of the period subsequent to 1919; I am coming to another point. How long were you with the Government of India after 1919?

A.—Until 1923.

Q—After this 1919 estimate, within a very short time, the figure went up to 702 lakhs. Was that reported to the Government of India? Had the Government of India any knowledge of it?

A.—I do not remember that myself. As a matter of fact I do not think at that period the Government of India had any say in the matter under the Constitution.

Chairman.—No, it had passed away by reason of the Reforms.

Mr. Billimoria.—What is the Constitution? Will you kindly explain, because it has been suggested in certain quarters that the matter was not worked constitutionally by the Bombay Government.

A.—The Constitution, as far as the Public Works Department is concerned, is thoroughly unsatisfactory, if you want to know my opinion.

Sir Frederick Hopkinson.—May I have that again. The Constitution——

A.—In so far as engineering activities and undertakings are concerned is, in my opinion, thoroughly unsatisfactory.

Q.—That is the general Public Works Department?

A.—Yes.

Sir M. Visvesvaraya.—Not in Bombay, but generally?

A.—I mean in the Government of India.

Sir Frederick Hopkinson.—And the Government of Bombay?

A.—No, because there they have their own Public Works Department, the same as elsewhere.

Mr. Billimoria.—I should like to know something more about this Constitution. You have been with the Government of India. Why should not the Government of Bombay have consulted the Government of India, who were responsible originally for sanctioning and approving the scheme, when the figure had doubled? Why were they not consulted?

A.—Why should they be?

Q.—They were the superior Government. They had the reins in their control. They had the supervision and control?

A.—Who?

Q.—The Government of India?

A.—No, they had not.

Q.—They always had. It is in view of that that this Committee has been appointed. It is in view of their supervision and control that we are here to-day.

A.—Surely, in 1921, the Government of India divested themselves of their responsibility for engineering activities and undertakings, and delegated all the supervision to provincial governments?

Q.—What about financial control?

A.—I am not concerned with that. I am only concerned with the engineering point of view.

Q.—It is in view of this circumstance that you say it was not necessary that the Government of India should have been approached or informed of the estimates having doubled within a very short time of the Government of India having sanctioned the scheme?

A.—Apparently it was not necessary since the Constitution had changed in the meanwhile. I do not say I consider it satisfactory, but those appear to be the facts.

Q—In the course of evidence you mentioned something about the guarantees to be given by the makers. Do makers give any such guarantee?

A.—I should imagine they certainly would.

Q.—Was there any attempt made to obtain such a guarantee in this particular instance?

A.—I know nothing whatever about the placing of the order for the dredger, and I refuse to have anything whatever to do with it.

Q.—Does it come to this—that you did not consider this as a dredging proposition at all?

A.—Oh, no; I do not say that, but the actual design and construction and the ordering of the dredger was no concern of mine, and apparently was not carried out under conditions which I myself would have observed.

Q.—So you are not in a position to say why Messrs. Simons in particular were preferred for the building of the dredgers?

A.—I understand there were only three firms in the market. One of them tendered in excess of the £600,000 and the other one did not tender at all, so that it came down to one firm.

Sir Frederick Hopkinson.—That is not quite true.

Mr. Billimoria.—You have remarked that you disassociated yourself from the purchase of the dredger. What did you actually do? How did you disassociate yourself?

A.—I disassociated myself by noting on the file that I had no concern with this. It was ordered, I presume, through the Secretary of State.

Q.—Was any other engineer consulted besides Sir George Buchanan? Was anybody's advice solicited by the Government of India before the scheme was launched?

A.—Not that I know of.

Q.—What were the reasons that led the Government of India to accept the report and recommendation of only one solitary engineer on a scheme of this magnitude?

A.—I really cannot say. It was done against my advice, so I am not in a position to make any remarks about it.

Q.—How long did the interview between you and Sir George Buchanan last in connection with the scheme?

A.—I think he called in to my office about four or five times, and that sort of thing and we talked it over together; but I really cannot remember at this interval of time.

Q.—Was it four or five hours at the most?

A.—I should think quite that, but I am not in a position to say.

Q.—How long did you take to consider carefully the report of Sir George Buchanan?

A.—It was gone into by my deputy first of all. Then it was separately gone into by myself, and then it was discussed by all three of us. That was the procedure.

Q.—How long does it usually take to consider such a report before any recommendations are officially put forward before the Government?

A.—I do not think any very great length of time.

Q.—You would superficially look at the proposition?

A.—I did not go into it in the detail in which the figures were given to me just now, I candidly admit; but I went into it as far as I considered necessary at the time from the general point of view. I was not in any way responsible for the actual details—cement, and everything else.

Q.—If the details had been closely studied, perhaps you would have detected that the estimates were very defective in material particulars?

A.—I think if we had gone into every single item in detail probably we should not have put up the figures which are put up here, but I am not in a position to say exactly what would have happened.

Q.—Do you not think, as a responsible official of the Government, that you should have given it more careful consideration than a merely superficial one?

A.—No, I do not. I should have done it if I had thought so. I was dealing with the project as a whole, and not with the details in particular, and I consider I did all I was required to do.

Q.—Even taking the project as a whole, if there were material defects which were apparent on the face of the estimate, should you not have brought them to the notice of the Government rather than accept any statement which Sir George Buchanan came and made to you?

A.—The only fact which I admit is new to me is this matter of the storm-water drains. I did not calculate that as part of the project, and I do not see personally why it should be part of the project.

Sir Frederick Hopkinson.—The project could not be carried on without them.

A.—Why should not the roads, and so on, come in?

Q.—You could not carry out the project without putting in the storm-water drains?

A.—Admittedly, but there was a great deal more work to be done besides the actual filling up of the compartments.

Q.—That is all in the estimates. All the roads and lighting and so on are in Sir George Buchanan's estimates—(all but the storm-water drains)—and they are based on an estimate given to him by the Public Works Department?

A.—There I admit I am at fault.

Q.—When Sir George Buchanan came to Simla did he bring with him the details and explain to you how he had arrived at these various prices in his estimate?

A.—Rough details, yes, but we did not go into details like those which you refer to there.

Q.—Did he say how much was for plant, how much was for material and how much was for labour?

A.—Yes.

Q.—So those papers are in existence, or they were in existence at that time?

A.—Yes.

Q.—He showed you those actual detailed prices?

A.—Yes, we talked over those details, but I did not go into details of cement and so on.

Q.—Those are the detailed prices on which the 367 lakhs estimate was founded?

A.—Yes.

Mr. Billimoria.—What we come to eventually is this—that your department took this matter very light-heartedly without going into the details before they recommended the scheme to the Government of India?

A.—There I am afraid I cannot agree with you. I took this case just as carefully as I took—what shall I say—the Sukker Barrage of 16 crores, the Imperial City or the Sutlej Valley, and various other large projects which I had pass through my hands one after the other.

Q.—Devoting a few hours' thought to a project of this magnitude?

A.—It was given all the attention which it was possible for me to give at the time. I have said already that I did not go into it in the great detail such as is referred to here—the cost of cement, the cost of iron bars and so on. It was incidental to my other duties and it would not have been possible for me to do it.

Sir Frederick Hopkinson.—They were all essential details?
A.—Admittedly.

Chairman.—But why impossible? It must have been known perfectly well in India that the figures of these materials in 1919 had appreciated three times over the prices of 1912. Why impossibe?

A.—I made allowances for a certain appreciation, but I did not make allowances for the details.

Q.—You have told us that you regarded this as an engineering project. Will you tell us how Blocks 1 and 2 were going to be filled in? *This* is plan No. 1 attached to Sir George Buchanan's estimate. How are Blocks 1 and 2 going to be filled in?

A.—Do I not refer to that in my note?

Q.—I think not. I can tell you what the point is quite shortly. Blocks 1 and 2 cannot possibly be filled in from the harbour, because, if you scale it off, it is more than 10,000 feet. That was rather an important consideration, was it not?

A.—Most, but I understood it was going to be filled in by rubble brought in by train.

Sir Frederick Hopkinson.—No, all pumped.

A.—Dry filling is what they started on, and went on with, when I last saw it.

Chairman.—On Sir George Buchanan's report it was a dredging proposition, and Blocks 1 and 2 were going to be filled by pumping from the " Sir George Lloyd " with the " Colaba " as the intermediate pumping station delivering into Blocks 1 and 2 from the harbour—more than 10,000 feet?

A.—Yes.

Q. That escaped the attention of your deputy. He did not notice it?
A.—No.

Q.—You did not notice it?

A.—I did not notice it, no. Personally, I was under the impression that this end was going to be filled up by rubble.

Q.—Can you show us anything in the report which states that?
A.—No.

Q.—With regard to the position as it existed in 1919, if a local government such as the Bombay Presidency had desired to embark on a scheme of this character, they had to obtain the sanction, did they not, of the Government of India? I am now speaking before the Reforms?

A.—Yes. This project went through the Government of India.

Q.—I used the phrase, " They had to obtain the sanction of the Government of India."

A.—Was it the Government of India or the Secretary of State? I am not quite sure which it was. I think it was the Secretary of State.

Q.—At all events it went to the Government of India?
A.—Yes.

Q.—And from the Government of India it went to the Secretary of State here?
A.—Yes.

Q.—The Government of India would, of course, communicate with the Secretary of State here representing their views on any particular project?
A.—Yes.

Q.—Therefore, it was essential that the Government of India should be carefully advised by its specialists?
A.—Yes.

Q.—Because it would be on the opinion of the specialists that the Government of India would communicate with the Secretary of State?

A.—Do not call them specialists, because they have not got any specialists.

Q.—I am speaking of you for the moment as a specialist, as head of the Public Works Department, the Chief Engineer. The Secretary of State would have no representative there, and he must rely upon the information conveyed to him by the Government of India?

A.—Not in all these projects by any manner of means. He sometimes called together a committee of experts and examined the projects separately.

Q.—You mean here in England?
A.—Yes.

Q.—You mean that the Secretary of State could bring to the notice of experts here such information as was conveyed to him by the Government of India?

A.—He would receive a project like this (and there were many of them going through my hands) and, either he would examine it or not, as he thought fit at the time.

In some instances—irrigation projects, for example—individuals or small committees were put on to examine the project.

Q.—In England?

A.—In England.

Q.—But the technical advice of the man on the spot in India would naturally weigh very much with the Secretary of State and his advisers?

A.—Yes, to the extent of recommending it or not recommending it. It might have been sent forward with the statement that the Government of India did not agree at all to the project.

Q.—This was a scheme of very great magnitude?

A.—I do not think it was anything out of the way. Schemes very much bigger than this have gone through my hands during the time I was at Simla. The schemes I have already mentioned were much larger.

Q.—Is it not the largest reclamation scheme which has ever been attempted on an open sea front?

A.—Yes, very probably it is, or as large as any.

Q.—Did you regard it as a matter in which it was your duty to give it a very high degree of care and consideration?

A.—I gave it all the consideration which was possible, with my knowledge and time, and then I asked for those three engineers to be consulted separately as experts, because I did not consider that my knowledge in this particular line of engineering was sufficiently good.

Supplementary Statement by Sir Sydney Crookshank.

In connection with my examination by the Committee may I emphasise the following points :—

(*a*) My connection with the project was incidental to my other duties as the then (1919) Secretary to the Government of India in the P.W.D., and in giving my evidence I had to draw on imperfect recollections dating back nearly 7 years.

(*b*) The project was carefully examined by me on the conditions which obtained at the time taken as a whole, and I was satisfied that the 400-lakh estimate which I recommended to the Government of India was a sound proposition. I was not responsible for subsequent events.

(*c*) Not being an expert in reclamation work myself, I made a specific recommendation to the Government of India to obtain specialist consulting advice on the project, and gave the names of experts whose opinions could be relied upon. No notice was taken of this proposal by higher authority.

(*d*) As regards the execution of the work I again made a specific recommendation to the Government of India, which again was disregarded.

(*e*) I gave it as my opinion that the success of the undertaking hinged on the efficiency, i.e. the output, of the dredging and pumping plant. In the circumstances of the work this vital consideration would ordinarily be assured.

(*f*) In writing I disassociated myself with any connection with the purchase of the dredging plant.

44th Witness, Sir Maurice Henry Weston Hayward, K.C.S.I., I.C.S.

WRITTEN STATEMENT.

I am sorry not to have been able to send a summary beforehand of my evidence as I have only recently returned home and have no official papers with me on the subject. I can, in any case, however, give no evidence as to the details mentioned in the questions prepared by the Committee, but can only, relying on my memory, offer some general remarks on the Back Bay scheme and the necessity of proceeding with it in the general interests of the City of Bombay and the Presidency.

The congestion in the City was brought prominently to notice so far back as the plague of 1897. The conditions of the chawls occupied by the working classes was wretched, and it was with the object of building new chawls of an improved type and opening out ventilating thoroughfares through the congested parts of the City that the Improvement Trust Act was passed in 1898 under Lord Sandhurst. Considerable improvements were effected under this Act, but progress was slow and its financial provisions had to be strengthened in 1905 or thereabouts under Lord Lamington or Lord Sydenham. But it was soon found that more energetic measures were necessary to remedy the existing state of things, particularly in view of the increase of nearly 50 per cent. in the population from 800,000 to nearly 1,200,000. A general scheme including

the more rapid provision of chawls and the reclamation of Back Bay was therefore sanctioned in 1919 under Lord Lloyd, and the working of it was placed under a special department named the Development Department. The object was to provide healthy residences for the working classes in place of the miserable overcrowding they were subjected to in the old and insanitary structures and to provide open spaces for healthy recreation, and spaces for improved residences for other classes and for the development of the trade of the City of Bombay. The urgent necessity for some provision for the latter was plain from the exorbitant rents levied for flats, whether for residences or offices in the neighbourhood of the Fort and the prohibitive rates and overcrowding on Cumballa and Malabar Hills. The chawls were recognised as a necessity which had to be financed out of the proceeds of a special cotton cess, but it was hoped that the Back Bay reclamation, as then estimated, would eventually result in a substantial profit to the general revenues of the Bombay Presidency.

The commercial point of view was no doubt of great importance in regard to the Back Bay reclamation but it was not the essential one. The essential point was the relief of congestion throughout the City of Bombay. It was not solely and merely a business proposition, any more than famine relief works for the Presidency. The urgent need for relief of overcrowding, particularly for the working classes, must not be overlooked, many of whom were yearly immigrants to the City from other parts of the Presidency. It was not to be expected that opposition would not be met with from landed vested interests nor that these would not be exploited for political party purposes. But they must not be permitted to overshadow the urgent requirements of the working and other classes. The repeated misstatements and irresponsible insinuations made from time to time were publicly refuted in the debates in the Legislative Council. The commercial success of the Back Bay reclamation depended on the speed with which the dredging operations progressed. They began towards the end of 1923 and gave satisfactory results to the best of my recollection for the working season 1923-24. It was not until the working season 1924-25 that less satisfactory reports were received nor till the season 1925-26 that the revised estimates indicated the probability not only of no substantial profit, but of a substantial loss. The Committee has under inquiry the technical and other reasons which have led to this result and recrimination will not modify it. The Back Bay reclamation will as now estimated, probably cost money instead of making it, and it is necessary to face the fact. The scheme will have now to be regarded from the same point of view as numerous other municipal improvements in the City of Bombay and elsewhere in the Presidency.

The congestion in the City of Bombay was undoubtedly in urgent need of remedy, and in estimating from this point of view the value of the Back Bay reclamation, it must be remembered that it will provide an extended sea face and valuable open spaces for healthy recreation as well as the many broad roads, none of which have been taken into account in the commercial valuation of the scheme. It will in fact vest, after all lands to be sold have been sold, an important and valuable property in the City of Bombay. It must also be remembered that if the original estimates were over sanguine, the revised estimates will possibly prove unduly pessimistic. They were made during the slump in land values and the depression due to the unexpectedly slow recovery of trade, while improved reports were subsequently received of the progress of the work. But even if the scheme should result in the estimated net expenditure of 3 crores, it would surely be worth the money for the immense improvement to the City of Bombay. It would anyway seem to be an entirely false economy to stop the work now and entirely throw away the 5 crores already expended. It would be far more prudent to secure the valuable property in progress of being made by expending the further 6 crores required. It was decided on this view of the matter to provide a sinking fund of 20 lakhs a year to meet the estimated net expenditure of 3 crores and to proceed with blocks 1, 2 and 8 while reserving the progress of the remaining blocks for further investigation. It was thought that the expense of securing a permanent property of so great value might suitably be spread over several generations of residents of the City of Bombay. The necessary provision was therefore made in the provincial budget for 1926-27, and a Bill imposing a stamp duty on conveyances of property to a like amount, which would chiefly fall on the City of Bombay, was recently passed by the Legislative Council. It has at the same time to be remembered that this is not merely a question of the City of Bombay, the Deccan and up-country districts rely largely on the market and port of Bombay. It is necessary therefore in my opinion to proceed to execute the whole scheme even at the present estimate of expenditure for the welfare of the whole Presidency of Bombay.

Oral Evidence.

Chairman.—You have furnished us with a memorandum, and you begin by saying: "I am sorry not to have been able to send a summary beforehand of my evidence, as I have only recently returned home and have no official papers with me on the subject. I can, in any case, however, give no evidence as to the details mentioned in

the questions prepared by the Committee, but can only, relying on my memory, offer some general remarks on the Back Bay scheme and the necessity of proceeding with it in the general interests of the City of Bombay and the Presidency." What position did you occupy in the year 1919?

A.—I was Judge of the High Court.

Q.—In 1920?

A.—A Judge of the High Court.

Q.—And for how long did you continue in that capacity?

A.—Until I joined the Bombay Government in 1921.

Q.—In what capacity?

A.—I was in charge of the Home Department.

Q.—By January, 1921, the scheme had already been set on foot?

A.—Yes.

Q.—It was announced on 3rd August, 1920, by Lord Lloyd in the Legislative Council as a scheme which had been decided upon?

A.—I was not present then.

Q.—You may take it safely from me that that is so.

A.—I will take it from you.

Q.—On that same date he announced the creation of the Special Department, the Development Directorate. Had the housing problem of Bombay been a matter of great anxiety to the Government for many years before 1919?

A.—I can say from my own personal knowledge that it was a matter of very great anxiety from the years of the plague, 1897.

Q.—You say in your statement: "The congestion in the city was brought prominently to notice so far back as the plague of 1897. The conditions of the chawls occupied by the working classes was wretched, and it was with the object of building new chawls of an improved type and opening out ventilating thoroughfares through the congested parts of the city that the Improvement Trust Act was passed in 1898 under Lord Sandhurst."

A.—Yes.

Q.—"Chawl" is the name given to workmen's dwellings in Bombay?

A.—Yes; if the word "dwellings" can be properly applied to such a place.

Q.—How do you mean?

A.—If the word "dwellings" is properly applicable to chawls of the old type. I merely say that to accentuate the wretched and insanitary condition of the old type of chawl.

Q.—"Considerable improvements were effected under this Act, but progress was slow and its financial provisions had to be strengthened in 1905 or thereabouts under Lord Lamington and Lord Sydenham. But it was soon found that more energetic measures were necessary to remedy the existing state of things, particularly in view of the increase of nearly 50 per cent. in the population from 800,000 to nearly 1,200,000." Was that congestion the result of the boom in trade during the War? Is that the period to which you are referring, or was it prior to that?

A.—It was prior to that. It began prior to that.

Q.—Do you think by 1916—that is a year and a half after the War had begun—that the population of Bombay was about 1,200,000?

A.—I could not say without the papers, but I think it was approaching that figure.

Q.—Am I right in thinking that from 1916 there was a still greater influx continuing down to 1919 or 1920?

A.—I rather think so; but, again, I am speaking without the book.

Q.—We have had some evidence about it.

A.—I believe the population now is over 1,200,000. I was told it was even up to 1,400,000.

Q.—"A general scheme, including the more rapid provision of chawls and the reclamation of Back Bay, was therefore sanctioned in 1919 under Lord Lloyd." You say in 1918, but I have corrected it to 1919?

A.—Yes.

Q.—Lord Lloyd came out in December, 1918?

A.—That must be so.

Q.—"And the working of it was placed under a special Department, now the Development Department." Should not that be the Development Directorate?

A.—Well, the Development Department was the Department which superintended it.

Q.—"The object was to provide healthy residences for the working classes in place of the miserable overcrowding they were subjected to in the old and insanitary structures,

and to provide open spaces for healthy recreation, and spaces for improving the residences for other classes, and for the development of the trade of the City of Bombay." The Development Directorate had many other activities beyond the reclamation of Back Bay?

A.—Yes.

Q.—As you point out, some of the activities were directed to ameliorating the condition of the poorer classes?

A.—Yes.

Q.—" The urgent necessity for some provision for the latter was plain from the exorbitant rents levied for flats, whether for residences or offices, in the neighbourhood of the Fort, and the prohibitive rates and overcrowding on Cumballa and Malabar Hills. The chawls were recognised as a necessity which had to be financed out of the profits of a special cotton cess, but it was hoped that the Back Bay reclamation as then estimated would eventually result in a substantial profit to the general revenues of the Bombay Presidency." I suppose you saw the report of Sir George Buchanan?

A.—Which report?

Q.—He only made one report, the report of September, 1919, which was in the hands of the Government in October, 1919. Is that a document with which you are familiar? (*Report handed.*)

A.—I am not familiar with it, but I have no doubt that it was available to me officially.

Q.—The scheme on paper, that is to say if the work could have been done for 367.61 lakhs, was an extraordinarily good one, was it not?

A.—Yes.

Q.—On almost any showing there was a certainty of profit at that price if the work could be done within the stipulated time?

A.—Time was of the essence of the contract.

Q.—You continue: " The commercial point of view was no doubt of great importance in regard to the Back Bay reclamation, but it was not the essential one. The essential point was the relief of congestion throughout the City of Bombay. It was not solely or merely a business proposition, any more than famine relief works for the Presidency. The urgent need for relief of overcrowding, particularly for the working classes, must not be overlooked, many of whom were yearly immigrants to the city from other parts of the Presidency." Do you mean seasonal immigrants when you say " yearly immigrants "?

A.—A great number of mill hands come from the Ratnagari district and stay in Bombay for a season and then return home.

Q.—" It was not to be expected that opposition would not be met with from landed vested interests, nor that these would not be exploited for political party purposes. But they must not be permitted to overshadow the urgent requirement of the working and other classes. The repeated misstatements and irresponsible insinuations made from time to time were publicly refuted in the debates of the Legislative Council. The commercial success of the Back Bay reclamation depended on the speed with which the dredging operations progressed." That was indeed the crux of the whole position, was it not?

A.—Yes.

Q.—The first essential was to obtain the permission of the Port Trust and the Royal Indian Marine to allow the dredging; the second essential was to be quite sure that there was the material to dredge, and the third essential was that the dredger could do its work. Is that right?

A.—I am not aware about the question of obtaining the consent of the Port Trust.

Q.—Have not you heard about that?

A.—I have heard about it but I am not myself familiar with it.

Q.—Under Section 28 of the Port Trust Act the whole of the bed of the sea is vested in the Port Trust absolutely. They are the owners of it. It never occurred to anyone to ask their permission?

A.—It may be, but that is not a subject with which I am personally familiar.

Q.—At all events, two great essentials were to know with certainty that there was material of the quantity and quality necessary, and to get a dredger that could pump that material at the specified rate?

A.—Quite so.

Q.—You continue: " They began towards the end of 1923 and gave satisfactory results to the best of my recollection for the working season 1923-24." I think I can show you in a moment that that is not quite correct, but you may have got that impression from the report of the Development Directorate. The dredger was supposed to be able to deliver on the reclamation site 5,000,000 cubic yards in one year, pumping

2,000 cubic yards per hour for 15 hours a day for 170 working days of the year. The actual fact is this. She commenced pumping on the 8th December, 1923. Were you present?

A.—I inspected the works soon after the pumping had been begun.

Q.—Sir George Lloyd himself left on 9th December, 1923, I think?

A.—Yes.

Q.—The dredger started to work on the 8th December?

A.—Just before he left.

Q.—One day before he left?

A.—Yes.

Q.—Have you noticed that instead of 2,550 pumping hours she did in fact 843, which is about one-third; and instead of pumping 2,000 cubic yards an hour she pumped 1,020, roughly 50 per cent.; and owing to possibly the porousness of the sea wall, the actual amount of cubic yards which was supposed to have passed through her pipe-line being 859,858 cubic yards, there was found to be deposited in the Back Bay only 528,000; that is 528,000 as distinguished from 5,000,000, so that that was not a good result?

A.—I cannot speak to those figures.

Q.—It was only just to correct this statement that I mentioned them.

A.—When the dredger began the results appeared at first satisfactory, and the material which they were pumping was very good. At that time, when the dredger first began, my recollection is that the engineers were satisfied with the work.

Q.—When did you leave India?

A.—I gave over charge of my duties in January of this year. I actually left India some months later. Of course these figures were not available until the end of the season or a good deal later.

Q.—In view of those figures that I have shown you I suppose you would like to qualify this statement: "They began towards the end of 1923 and gave satisfactory results to the best of my recollection for the working season 1923-24." Having seen those figures, they do not show a satisfactory result, do they?

A.—I should be bound to admit that when those figures were known the result would not have seemed so satisfactory.

Q.—"It was not till the working season 1924-25 that less satisfactory reports were received, nor till the season 1925-26 that the revised estimates indicated the probability not only of no substantial profit but of a substantial loss."

A.—I should like to add here that the figures of 1923-24 would not have been available for our consideration until late in 1924-25. I have written what was my recollection, that it was not until 1924-25 that we became aware that the dredging was not as satisfactory as had been hoped.

Q.—The fact that she had only pumped for 843 hours instead of 2,550 hours would have been available to you?

A.—What is the date of this report?

Q.—This is quite recent. It is Sir Lawless Hepper's preliminary statement to us.

A.—You cannot tell me at what date those figures were available to the Government.

Q.—Certainly, by August of 1924.

A.—That is exactly my point. Personally they would not have come to my notice until the season of 1924-25.

Q.—"The Committee has under inquiry the technical and other reasons which have led to this result, and recrimination will not modify it. The Back Bay Reclamation will, as now estimated, probably cost money, instead of making it, and it is necessary to face the fact. The scheme will now have to be regarded from the same point of view as numerous other municipal improvements in the City of Bombay and elsewhere in the Presidency." You mean, I suppose, as a permanent work of permanent advantage to the community?

A.—Yes.

Q.—Which must not necessarily be judged on the basis of immediate profit or loss?

A.—Quite so.

Q.—"The congestion in the City of Bombay was undoubtedly in urgent need of remedy, and in estimating from this point of view the value of the Back Bay Reclamation, it must be remembered that it will provide an extended sea-face and valuable open spaces for healthy recreation as well as the many broad roads, none of which have been taken into account in the commercial valuation of the scheme." That was the original plan, was it not, that apart from the Military area and block 8, which was going to be sold, some 239 acres, nearly a half of the reclamation, were going to be taken up with recreation grounds and broad roads?

A.—I cannot say whether it was nearly a half, but a large part was.

Q.—" It will, in fact, vest, after all lands to be sold have been sold, an important and valuable property in the City of Bombay. It must also be remembered that if the original estimates were over sanguine, the revised estimates will possibly prove unduly pessimistic." On that point it has been stated that the ultimate cost would be 11 crores?

A.—Yes.

Q.—Lately there has been a revision, and it is believed that, even if the whole of the work is completed, it will be done for 10 crores, which is £7,500,000. Assuming it to be the fact that the whole of the work will be completed at a cost of £7,500,000, would you, in view of all the circumstances, proceed with the work, and carry it through?

A.—Certainly. I explain that later.

Q.—Then speaking of the estimates, you continue: " They were made during the slump in land values, and the depression due to the unexpected slow recovery of trade, while improved reports were subsequently received of the progress of the work. But even if the scheme should result in the estimated net expenditure of "—you have put three crores?

A.—Yes, that is the net expenditure.

Q.—By " expenditure " you mean net loss?

A.—The net loss.

Q.—" But even if the scheme should result in," may I say an ultimate net loss of three crores?

A.—No, not " net loss " ; I used the word " expenditure." It means that for the expenditure of three crores the inhabitants of Bombay City will have a very valuable property added to the City. The cost to the City will be three crores.

Q.—You mean that the excess of cost over receipts will be three crores?

A.—Yes.

Q.—" But even if the scheme should result in the estimated net expenditure of three crores, it would surely be worth the money for the immense improvement to the City of Bombay. It would anyway be an entirely false economy to stop the work now, and entirely throw away the five crores already expended. It would be far more prudent to secure the valuable property in progress of being made by expending the further six crores required. It was decided, on this view of the matter, to provide a sinking fund of 20 lakhs a year to meet the estimated net expenditure of three crores, and to proceed with blocks 1, 2 and 8, while reserving the progress of the remaining blocks for further investigation. It was thought that the expense of securing a permanent property of so great a value might suitably be spread over several generations of the residents of the City of Bombay. The necessary provision was, therefore, made in the Provincial Budget for 1926-27, and a Bill imposing a Stamp Duty on conveyances of property to a like amount, which would chiefly fall on the City of Bombay, was recently passed by the Legislative Council. It has at the same time to be remembered that this is not merely a question of the City of Bombay. The Deccan and Upcountry districts rely largely on the market and Port of Bombay. It is necessary, therefore, in my opinion, to proceed to execute the whole scheme, even at the present expenditure for the welfare of the whole Presidency of Bombay." Do you know of any expert, except Sir George Buchanan, whom the Governor of Bombay consulted before the 3rd August, 1920?

A.—I cannot speak to anything before January, 1921.

Q.—In January, 1921, you became a Member of the Government?

A.—Yes.

Q.—A matter that must have been causing the Government a great amount of consideration was this Back Bay Reclamation?

A —The scheme was then already settled.

Q.—True it was settled, but it was regarded as a matter of vital importance to Bombay, was it not?

A.—It was regarded as important.

Q.—And would be a matter of conversation amongst officials in the Government?

A.—Undoubtedly.

Q.—Did you ever have any conversation with Lord Lloyd about the matter?

A.—I should like to get quite clear as to the trend of that question. As a Member of Council, it would not be proper for me to speak to any considerations or conversations in the Council. I think you understand that? We all take an oath not to speak of matters which are concerned in Council. That is a necessary provision for all Executive Councils.

Q.—I do not know that I quite understand you. Let us take 1921. In 1921, did you and Lord Lloyd ever have a talk about this Back Bay Reclamation?

A.—My point is this: that it would not be proper for me to disclose any discussions in the Executive Council. In fact, I am prohibited from so doing by my oath of office. When I took office I was bound by oath not to disclose the confidential discussions in

Council. I should like to be quite sure of my position before pursuing this. I hope you understand me? It is not with any desire not to answer any question that I possibly can that I say this : but I should like to make my position quite clear to you.

Q.—As regards any discussions that took place in the Council, you take the point that you are bound not to disclose what they were?

A.—Yes, I do not think I should be justified in doing it one way or the other.

Q.—If it should become necessary after Lord Lloyd has given evidence, I have no doubt one could make arrangements by which release could be given, and then we could ask you the question?

A.—I dare say you are aware that release can be given by His Excellency the Governor.

Q.—No doubt that can be done, if it is required. But discussions after dinner hardly come within that category. Did you have any?

A.—Of course the Back Bay Reclamation scheme was discussed freely in public.

Q.—And on social occasions?

A.—On public and on social occasions, undoubtedly.

Q.—At any social occasion, when you and Lord Lloyd were discussing the Back Bay scheme, did he ever tell you that he had ever taken the advice of anybody except Sir George Buchanan?

A.—I could not recollect; that is a good many years ago.

Q.—Have you ever heard the name of any man mentioned as having tendered advice to Lord Lloyd, except Sir George Buchanan?

A.—I cannot say.

Q.—You mean you have no recollection of ever having heard of one?

A.—There must have been local engineers who must have given opinions.

Q.—Did they? Have you any knowledge that they did?

A.—I cannot speak of my own knowledge.

Q.—We have tried hard to find out, and up to now we can find no one.

A—I have no doubt that that question can be answered by Lord Lloyd.

Sir M. Visvesvaraya.—The original estimate was about 400 lakhs for the scheme—367 lakhs.

A.—I think it was 367 lakhs. I have seen it so stated in the papers.

Q.—It was a boom time when the work was started and the prices of land were very high.

A.—At which time?

Q.—At the time of sanctioning of the project.

A.—In 1919?

Q.—In 1919 and 1920.

A.—I think prices were then rising.

Q.—When after two or three years' experience the estimates were doubled and the land prices fell, did the Government take any steps to review the position and to adjust their expenditure and policies accordingly, or did they continue irrespective of change of circumstances?

A.—That is rather a general question.

Q.—You can only answer general questions because you have not had time to acquaint yourself with the details?

A.—The question of the Development Department was continually under the consideration of the Government, and was also continually under the consideration of the Legislative Council. The full accounts were laid every year at the time of the Budget before the Legislative Council.

Q.—But there was no change of policy, notwithstanding the change of circumstances?

A.—There were changes of policy in the working of the Development Department.

Q.—In the policy with reference to the reclamation scheme were there any changes? I suggest to you there were none.

A.—There was no change in the general policy of carrying out the reclamation scheme. Whether there were changes in the detailed methods of carrying it out or not I am not in a position to say; but there was no change in the general plan of carrying out the Back Bay reclamation scheme.

Q.—Although the estimate was doubled, and although the prospects of selling the land were dissipated, the Government continued to follow their policy?

A.—The prospects of selling the land were not dissipated.

Q.—But the prices have gone down very considerably?

A.—But prices, on the other hand, may rise considerably in the future.

Q.—There is a very large area of vacant land now available which cannot be sold. You are aware of that?

A.—No; not a very great deal.

Mr. Billimoria.—It is as big an area as this reclamation can produce, or even bigger.

A.—Where is that area?

Q.—In the town of Bombay. It is more than 30 lakhs of square yards.

A.—Not in the town of Bombay.

Sir M. Visvesvaraya.—We have got the report of the Advisory Committee to that effect?

A.—Possibly it is in the island of Bombay.

Mr. Billimoria.—It is in the town and island of Bombay—some of it in the northern part.

A.—There is a large area in the north of the island of Bombay, but I doubt very much whether there is a large area of land available for the town in the south part of the island of Bombay.

Mr. Billimoria.—There is a statement which has been recently submitted in which it is stated there are 30 lakhs of square yards.

Chairman: The witness says as regards the Fort district he questions whether there is any substantial area of land available.

Mr. Billimoria.—In the Fort district there are 370 lakhs of square yards. This is what the report says about land which is available: B.B. and C.I. railway land at Colaba, 34,525 square yards. G.I.P. railway land at Colaba, 105,577 square yards. Military lands in Fort and Colaba, 171,427 square yards. Colaba Land and Mill Company, Colaba, 55,822 square yards.

Sir M. Visvesvaraya.—That will show you that there is a lot of land available which can be sold, and they cannot sell it fast enough.

A.—I ask where is this land—in what particular vicinity?

Q.—It is given in that report.

A.—No; the vicinity is not given.

Q.—It says: "Vicinity of military land for reclamation area."

A.—The military land in the Fort and Colaba is only the Colaba Land and Mill Company's area. These are all smaller items; for the bigger items the locality is not given.

Q.—I quite agree with you that vacant land is required on the south also, but for purposes of sale there is a large area of vacant land which cannot be disposed of at reasonable rates at the present time?

A.—There is some land.

Q.—The prices of 80 to 100 rupees a square yard on which you estimated originally cannot be had if you throw open a large area of land for sale?

A.—No doubt that is the present position. My own opinion is in the future there is every probability of the value of the land rising.

Q.—That is quite right, but in the meantime the interest charges will be growing?

A.—That is true.

Q.—And the cost will be trebled or quadrupled?

A.—The interest charges will grow.

Q.—That is the real problem. I want to know whether the Government changed its policy in any way in view of the changed circumstances?— Will you kindly say yes or no to that?

A.—Which policy?

Q.—The policy of the Government with respect to the scheme. Did they change their policy or did they consider a change of policy necessary at any time in view of the change in the circumstances?

A.—The conclusion last reached before I left was to proceed with blocks 1, 2 and 8 and to decide about the remaining blocks thereafter.

Q.—You have seen the Advisory Committee's Report, I suppose?

A.—No, the Advisory Committee's Report was not in the hands of the Government before I left the Government.

Q.—They had decided to restrict operations, I think?

A.—Certain of the figures had been roughly presented and that was the conclusion.

Q.—When the estimate went up to 702 lakhs, was the scheme placed before the Legislative Council for their opinion or for their approval?

A.—What would be the date of that?

Q.—It would be about September, 1922.

Chairman.—We know it was not.

Sir M. Visvesvaraya.—It was not. The revised estimate was not placed before the Legislative Council?

A.—The Advisory Committee I imagine——

Q.—The Advisory Committee had nothing to do with it. This was not a concern for the Advisory Committee. I am putting to you the question of the sanction of the revised estimate of 702 lakhs. The first estimate was 367 lakhs?

A.—Yes.

Q.—That estimate was revised to 702 lakhs in the course of a couple of years, but that revised estimate was not placed before the Legislative Council and was not submitted to the Government of India. The Government themselves sanctioned it in their executive capacity as the records show?

A.—I cannot say of my own knowledge.

Q.—Is not the sanction of the local Legislature necessary to obtain funds for such a large project as this?

A.—I have already said that the Development Department's budget was submitted every year to the Legislative Council.

Q.—Is Budget sanction sufficient, and do you not want individual sanction for a large scheme like this?

A.—I think Budget sanction is sufficient.

Q.—The Government might sanction any large scheme and then merely place it at the time of the Budget before the Legislative Council? Would that be in order?

A.—We had the practice more recently of placing all large projects before the Legislative Council. I do not think it is required by the Act or the Rules under the Government of India Act.

Q.—You have had a discussion in the Council?

A.—I do not think it is required by the Government of India Act, but I know the practice later was to place all large schemes before the Legislative Council.

Q.—This was not placed before the Legislative Council, we know.

A.—You know that—you mean the revised estimate?

Q.—Yes.

A.—I have already said I cannot say without the papers or without reference to the debates in the Legislative Council.

Q.—How many Members of the Council dealt with this scheme? Have you any objection to telling me that? Was it the Governor and one other Member?

A.—I can tell you that an Indian Member of the Executive Council was in charge of the Development Department throughout the whole of the time that I was a Member of the Government. The Finance Member, of course, had to deal with the finances of the Development Department and His Excellency the Governor, of course, would deal with anything so important as the Development Department.

Q.—I suppose only the most important questions came before you as a Member of the Council and not the details?

A.—That is the general practice of Executive Governments. The more important questions only are referred to the General Council.

Q.—Were the Ministers kept informed of the progress of the work?

A.—The Ministers were present at almost all the meetings of the Executive Council and they must have heard the discussions upon all subjects of general importance which were brought before the Executive Council.

Q.—Are you aware that they were present when this subject of the Reclamation Scheme was discussed?

A.—They must have been. They must have been present at any important matters of that nature.

Q.—Our information was that they were not kept informed. Do you deny or accept that statement?

A.—I think that information must be incorrect.

Chairman.—I would like to fix the date because Sir Maurice Hayward did not become a Member of the Government till 1921. What is important to ascertain is what was taking place before August 3rd, 1920, as to which Sir Maurice Hayward can tell us little or nothing.

A.—I am only speaking of events after January, 1921.

Sir M. Visvesvaraya.—I am also referring to the conduct of the works after you became a Member. Was it the practice to keep the Ministers informed of the progress of this work or of the more important developments connected with the work?

A.—Are you referring to the period before 1921?

Q.—No, after 1921, during the construction of this work?

A.—I think I have already replied to that question, that all matters of general importance were brought before the Executive Council at which the Ministers were present.

Q.—Another late Member of the Government told us that the Ministers got their information when the subject was discussed before the Legislative Council and he did not say that the Executive Council gave any information to them.

A.—But was he asked that question?

Q.—We asked that question, and our information is that the Ministers had no information. I want to know from you what the real practice was?

A.—I think your information is incorrect.

Q.—Then we will learn that probably from other sources.

A.—I had occasion to look into the question of the number of meetings of the Executive Council at which reserved subjects were discussed in the presence of the Ministers, and I found that at almost all the meetings of the Executive Council at which Executive matters were discussed the Ministers were also present and heard the discussions. I had occasion to publish that in the Press in reply to certain misapprehensions of a learned colleague of mine who had also been a Member of the Council.

Q.—Why was not a correct statement of affairs published from time to time concerning this work, and why was not the public taken into confidence? I only ask for information. I am not criticising anyone.

A.—I do not admit that a correct statement was not published or that the public were not taken into confidence. I do not quite know what you are referring to.

Q.—A great many statements only came to light when Members of the Legislative Council put questions. As a result an Advisory Committee was asked to submit a report. It was only when the Advisory Committee made a report that a great many things came to light and a great many startling disclosures were made?

A.—The Advisory Committee were in existence to the best of my recollection from the earliest days of the Development Department.

Q.—But it is said they were not kept fully informed of what was going on?

A.—I am not aware of that. I imagine that the Advisory Committee had every information that they required.

Q.—Several witnesses deposed before us to that effect.

A.—I cannot speak of my own knowledge. The obvious way of ascertaining information is by questions in Council. Many questions were asked and were fully answered in the Legislative Council.

Q.—When the dredger did not give a satisfactory output what steps did the Government take to rectify matters? That was an important event in the history of the scheme. The failure or partial failure of the dredegrs was an important factor.

A.—At what date do you say it was known that the dredger had failed?

Q.—About 1924.

A.—I am not sure that the dredger had failed.

Q.—You are still in doubt?

A.—I should like to be more definite about that. Did the dredger fail or did the supply of mud fail?

Q.—The dredger was expected to give 5,000,000 cubic yards annually and it has only given about 1,800,000?

A.—I cannot speak to any question of technical detail, but I imagine there are two questions—whether the dredger failed or whether the supply of mud to be dredged did not fail.

Sir Frederick Hopkinson.—No, it did not.

A.—You say the mud did not.

Sir Frederick Hopkinson.—No.

Sir M. Visvesvaraya.—The mud is still there?

A.—Those are technical points on which I have no information.

Q.—Only a fraction of the mud has been handled till now. The whole of the mud is there. Did the Government make any systematic inquiry to find out why the dredger did not give the promised output. For two years they have been sitting over it?

A.—I believe not.

Q.—They have taken no action?

A.—They have not been sleeping over it.

Q.—They have taken no action?

A.—Inquiries were I believe made, but I have no personal knowledge of the particular inquiries. That was done in the Development Department.

Q.—But there is no continuous correspondence on the subject. We did not see that any systematic inquiries were made in that respect?

A.—I am afraid I cannot help you on that point.

Q.—Did the Government consider what the financial results of the scheme from time to time or from year to year would be, when they prepared the Budget and discussed these questions?

A.—The Development Department's budget was considered every year at the time of framing the Budget for the next year.

Q.—Only on the expenditure side?

A.—And the receipt side.

Q.—But no financial review was made? The financial prospects of the work were not reviewed from year to year?

A.—The Budget statement contained a capital statement as well as a Revenue Account. The Budget contained both a Capital Account and a Revenue Account.

Q.—That is usual, but was this work treated in the same way?

A.—It must have been included in the Capital Account.

Q.—Were the financial results examined from year to year or reviewed as compared with the original forecast?

A.—They must have been or they could not have been included in the Capital Account Budget.

Q.—There are no accounts of that character. There are none published?

A.—I can only suggest your examining carefully the Budget statement for each year of the Bombay Government and you will find there the Capital Accounts of all the major works, and certainly of all the works of the Development Department.

Q.—But not a review of the financial results?

A.—The capital account each year had to show what money was required and what capital was required to carry on the work.

Q.—The expenditure went on all right, but on the receipt side there was no review of the changes which had come about?

A.—The capital required had to be reviewed every year. The progress of the work had to be considered. The capital to be provided in the ensuing year had to be considered and had to be entered in the Budget. It was the most important item in the Budget.

Q.—I am not talking of capital at all.

A.—The whole of the expenditure on the Back Bay reclamation was capital account.

Q.—Without money the work cannot go on, and the expenditure side was all right; but the revenue side was not considered. That is what I am putting to you. I suggest the revenue side of the work was not considered from year to year in the Budget.

A.—I do not think there was any revenue side at that time.

Chairman.—There was no revenue; it was all expenditure?

A.—It was all expenditure.

Sir M. Visvesvaraya.—That is all I want on that. You suggest even though there may be a loss of three crores on this project, it is worth while to complete the scheme?

A.—Yes.

Q.—But three crores will be the loss even if you complete blocks 1, 2, and 8. There will be a net loss of three crores.

A.—The three crores will not be a loss at all. It will be the purchase price of a most valuable addition to the property of the city of Bombay.

Q.—But the money comes from the provincial taxpayer. It may be an addition to the amenities of Bombay, but why should the provincial taxpayer be required to pay for it?

A.—Because it is a most valuable addition to the headquarters and port of the Bombay Presidency.

Chairman.—And of a very beautiful city.

A.—And of a very beautiful city.

Sir M. Visvesvaraya.—Even if the loss is very much more than three crores you would proceed with the work, I take it? The three crores you have lost irrevocably.

A.—I should prefer not to involve myself in hypothetical questions.

Q.—But three crores have been lost; that is not hypothetical.

A.—I do not admit that the three crores will be lost. I say you have to remember it is merely the purchase price of a very important addition to a valuable property of the city of Bombay.

Mr. Billimoria.—If I may interrupt, it is not. After taking into account the value that will be realised by the disposal of the land, the balance really unaccounted for will be three crores, which sum the Government of Bombay have now decided to write off in a number of years from their annual revenues; so that it is a distinct loss.

A.—I think, if I may be permitted to say so, you overlook the fact that a very great portion of the land will not be sold at all, but will vest in the city of Bombay.

Q.—That is a very small area, comparatively.

A.—That is a matter of opinion; but I think it is a very valuable property that any municipality would be proud of.

Q.—There is a sum of 18 lakhs by way of interest to be paid every year by the citizens of Bombay for amenities which are hardly amenities at all.

A.—I think it is wrong to restrict it to amenities. It will very largely improve the trade possibilities of Bombay.

Mr. Billimoria.—That is a matter which is hypothetical.

Sir Frederick Hopkinson.—Being in charge of the Home Department you would, of course, take a keen interest in the progress of the Back Bay reclamation?

A.—I would take a keen interest in all important works of that nature in the Bombay Presidency.

Q.—Particularly in the progress of the Back Bay reclamation, because you see it pretty well every day, do you not, from the Secretariat?

A.—That alone would not be sufficient, because I tour all over the Bombay Presidency, and I see all the works of importance.

Q.—The answer to my first question is Yes?

A.—Yes; I did take an interest.

Q.—You say you did not know until August, 1924, that is the end of the season, what the dredger had been doing. The results were not given to you till August?

A.—That is my recollection without consulting the papers.

Q.—That would be when the Development Directorate report was published?

A.—I think so.

Q.—We have been told by one of the witnesses who was on the dredger that soundings were taken every day, and that it was possible for you to know each day what amount of work the dredger had done?

A.—Well, I cannot answer that. That is a technical question, but I should have thought you would have had to have waited until the end of the season before you ascertained it.

Q.—Oh, no!

A.—I am not an expert, and I am not in a position to answer.

Q.—As I put it to another witness, the dredger digs a hole and you can measure it at once, and you can do it as often as you like, morning and afternoon, day by day if you like, and tell exactly, or very nearly exactly, what has been done. Therefore, I want to know why the Bombay Government should wait until August to know how the dredger was getting on.

A.—Well, I am not an expert, but I imagine the tides play a good part in it.

Q.—They have nothing whatever to do with it.

A.—I can only say that it seems to me, as a non-expert, that it would have been wiser to wait till the end of the season before judging exactly what had happened.

Q.—Why should you wait a precious seven or eight months to know whether a dredger which cost nearly a million was fulfilling your expectations? You could have told at the end of the first week or at the end of the second week.

A.—I cannot say. That is a question for experts.

Q.—It is not a question for experts. I want to know why the Government of Bombay did not insist upon knowing what had been done.

A.—Well, I must repeat that that appears to me to be a question for experts; but I understand from you that it could have been ascertained.

Q.—Every day, if you like.

A.—On the other hand, I have been given to understand that a great deal of the dredging was eventually washed away.

Q.—That does not affect the question at all. The dredger was built to do certain work, not to retain it somewhere else. You could have known exactly what the dredger was doing. The fact that some of it was lost afterwards did not affect the efficiency of the dredger. If the dredger had dredged the material it was no fault of the dredger if the material was afterwards lost?

A.—No; I presume not.

Q.—Therefore, I wanted to know if you could tell me why no one in the Government, including yourself, who was responsible for this department——

A.—I was not responsible for this particular department.

Q.—I thought you were. You said the Home Department?

A.—Yes.

Q.—Is not that the Back Bay reclamation?
A.—No.

Q.—I beg your pardon. I thought it came under your department?
A.—It was not in my department at all.

Chairman.—It comes under the General Member?

A.—It comes under the General Department.

Q.—The General Member?
A.—Yes.

Sir Frederick Hopkinson.—Still, as a member of the Legislative Council and a member of the Government, I want to know why you did not ask a question as to what the dredger was doing, because it has been generally recognised in the original report, and in every document since, that the dredging is the crux of the whole scheme. If the dredging was all right the other things did not matter very much. What I want to know is why no one in the Government was sufficiently curious to insist upon knowing what the dredger was doing?

A.—I cannot say in the first instance that no one in the Government did ask that question.

Q.—I have asked every other witness who has come before us that question, and no one has answered it?

A.—The members of the Government in charge of the Development Department were Sir Chimanlal Setalvad and Mr. Cowasji Jehangir. I cannot say what questions they asked, or what inquiries they made. It would not have been within the scope of my duties to interfere in that matter as Member in Charge of the Home Department.

Q.—I should have thought you would have said to the Member who was responsible: "How is your dredger getting on?" Do not you think that you might have said that, being keenly interested in this very important work in Bombay?

A.—If the Member in Charge of the Department was satisfied with the work it would hardly be my place——

Q.—But he did not know; he could not be satisfied?

A.—I think it was hardly the business of the member in charge of the Home Department.

Q.—It all depends. I think if I had been in your position I should have said to the General Member: "I hope your dredger has been doing well this last week or this last month." Do you not think that would have been a reasonable question to put to a colleague?

A.—I think you hardly appreciate the working of the Bombay Government?

Q.—I do not know anything about the working of the Bombay Government, but you and the General Member are colleagues. I suggest to you that it would have been a reasonable thing for you to have said: "How is your dredger getting on." The heart of this scheme, which is going to be of such importance for the City of Bombay, is the dredger; but no one seems to have expressed a wish to know what the dredger was doing?

A.—I think you are under a misapprehension.

Q.—I am not.

A.—We most of us did inspect these works from time to time, and did see what was going on.

Q.—But you cannot say what was going on?

A.—And did generally inquire how the work was going on.

Q.—What answer did you get?

A.—The Director of Development took us on several occasions round the works to show us what was going on.

Q.—Did he ever say to you that the dredger was only doing half its estimated quantity?

A.—Undoubtedly I must have heard that later on. What particular time I cannot say.

Q.—I am speaking now at any time from January to July, 1924. Did not he know himself that the dredger was only doing half its estimated quantity per hour, and only one-fifth of its estimated quantity per year?

A.—I think you have examined him.

Q.—We have.

A.—Then I imagine he has informed you whether he knew or whether he did not know.

Q.—I am not sure whether I put that question to him?

A.—I could not answer for him; but I think that information must be got from the Director.

Q.—Did he ever tell you that the dredger was doing so badly that they were only getting half the estimated quantity?

A.—I cannot answer definitely a question of that kind; but certainly we must have heard later on in the work that the dredger was not doing satisfactorily. I cannot tell you the exact date.

Q.—You cannot tell me anywhere near, from January to July, 1924?

A.—No; I could not.

Q.—The first season this dredger only did about one-fifth of its estimated quantity per annum. That, surely, would be a matter of very great concern to the Government of which you were a member?

A.—Yes.

Q.—Was anything done, do you know?

A.—I cannot say. I was not in charge of the Department.

Q.—We will leave it at that. You said just now that time was the essence of the contract?

A.—Yes.

Q.—That would have a very important bearing on cost because of the question of interest and compound interest?

A.—Yes.

Q.—The estimated time for completion was 1926?

A.—I cannot say.

Q.—You do not know?

A.—No.

Q.—You have not read Sir George Buchanan's report?

A.—I have not studied it.

Chairman.—You may take it it was 1926?

A.—I will take it from you.

Sir Frederick Hopkinson.—In July, 1924, when the dredger had done approximately 1,000,000 yards of dredging out of 25,000,000 yards, you must have seen that the cost was going to be enormously increased over the 702 lakhs estimate by reason of this interest charge and compound interest?

A.—I think that must have been realised in the Department.

Q.—That is as far as you can say. You spoke just now of a programme for chawls. Can you tell me how many it was intended to build?

A.—50,000.

Q. Do you know how many have been built?

A.—I am speaking without papers, but I think about 20,000; or have you the figures?

Q.—I was told it was 17,000?

A.—I am not far out in saying in round figures 20,000.

Q.—Has the progress of construction of these chawls been entirely stopped?

A.—I cannot say whether it has been entirely stopped.

Q.—How far?

A.—It has been reduced.

Q.—Has it not been stopped? Was it not stopped last year?

A.—You have not been able to obtain that information from any other witness?

Q.—I am asking you?

A.—Well, I was not in charge of the Department. I am merely speaking from memory. If you want really to know the facts, the best person to ask would be somebody in the Development Department.

Q.—Do you not know as a general fact that the construction of chawls has been stopped?

A.—I remember it was very materially reduced.

Q.—After completing 16,000 or 17,000?

A.—It was very materially reduced. Whether it has been finally stopped or not, I am not in a position to say. I think very likely you are right.

Q.—Does not that point to a very large over-estimate of the necessities of the case in 1919?

A.—Not necessarily.

Q.—Why not?

A.—There is the question of being able to let chawls at a rate which will cover the cost less the cotton cess.

Q.—Is it not the fact that a very large number of the chawls already built remain unoccupied?

A.—I cannot say at the present moment. A good many were when I left.

Chairman.—When we left they were unoccupied, too?

A.—There is this other problem, that you may build a very nice chawl, but you have next to get the people to live in it. Some of the people at present prefer to herd four or five families in one room. You may build them four or five nice rooms and say: "There they are; please occupy them," but they will not go into them. Therefore, you must take that into consideration when you are judging whether the estimate was an over-estimate in 1919.

Q.—You would take that into consideration before you decided on building 50,000, would you not?

A.—No, not necessarily.

Q.—Why not?

A.—Not necessarily before providing the necessary space for that number of chawls.

Q.—Never mind the space?

A.—You have to have the space for your chawls.

Q.—You decided to build 50,000 chawls?

A.—In the hope that the people would move out of their congested slums and live in them.

Q.—But the character and nature of the people have not changed since 1919?

A.—It was hoped that the provision of nice chawls would change their nature.

Q.—Please answer my question: Do you think the nature of the people has changed since 1919?

A.—I think the standard of living is steadily, if imperceptibly, rising.

Q.—Therefore, they would be more likely to want new chawls?

A.—Yes.

Q.—Do you not think the character of the people requiring somewhat better accommodation should have been considered by the Government before they decided to build 50,000 chawls? Having decided to build 50,000 chawls, finding it not necessary to build any more after they have built 16,000 or 17,000, a large number of those being unoccupied, do you not think it points to a great want of estimating power on the part of those people who decided to build the 50,000 chawls?

A.—I do not think it indicates any want of estimating power in regard to the Back Bay Reclamation.

Q.—We are not speaking of the Back Bay Reclamation; we are speaking of the chawls for the moment?

A.—I understood that the subject of this Inquiry was the Back Bay Reclamation?

Q.—I am trying to connect the two, by suggesting to you that the same people who made the estimate for the one made the estimate for the other?

A.—I do not think the same people did make the estimate.

Q.—Well, the same Government. They had the same optimistic views, shall I say, and having gone wrong in one case they were just as likely to have gone wrong in the other?

A.—I do not think that logically follows.

Q.—50,000 chawls mean 50,000 tenements. When I asked the meaning of chawl, which I did not know, I was told it was a one-roomed tenement?

A.—A chawl generally is a large building containing a great number of tenements. When you speak of building 50,000 chawls, you mean 50,000 tenements. I understood you perfectly.

Q.—I was very much struck with the statement you made just now to the effect that the dredger gave satisfactory results in 1923 and 1924. The satisfactory result given was that it did one-fifth of its estimated quantity?

A.—I think I have already explained my meaning, in answer to a question put by the Chairman.

Q.—Would you mind telling me it again?

A.—When the dredger began it appeared that the dredging was satisfactory. We actually saw the work. We saw it at work. At that time the engineers seemed pleased with what it was doing. It was not until late in 1924 that the results of the dredging were known.

Q.—Therefore you did not know this until they had spent six or seven months in working?

A.—I did not.

Q.—Sir Mokshagundam said something about taking the public into their confidence. So far as I know, the principal reports made by the Government to the public were the Annual Development Reports. I suppose you have seen those?

A.—Yes. I got copies.

Q.—Do you think there is anything in there which goes any distance towards taking the public into the confidence of the Government about the progress of the work?

A.—I cannot say I have studied them sufficiently to answer that question.

Q.—In one year, when the dredger was doing one-fifth of its output, I think they said: "The works are proceeding satisfactorily." You would not call that taking the public into their confidence, would you?

A.—I cannot say. I have not really studied those reports sufficiently.

Q.—But what would you say if that is the case?

A.—That is hypothetical.

Q.—No, not hypothetical. It is concrete. The Government say: "The works are proceeding satisfactorily." At that time one-fifth of the proper output had been done. Would you call that a correct description?

A.—I could not give you an opinion on the report without studying it carefully.

Q.—I do not ask you to do that. I ask you to give me your opinion on a particular paragraph which I mention to you?

A.—It would hardly be fair to give an opinion on a particular paragraph.

Q.—It has nothing to do with the rest of the report. They say: "The works are proceeding satisfactorily." At that time the dredger was doing one-fifth of its proper quantity. Would you call that a proper description?

A.—I can only say that I am not prepared to answer a question of that nature on a single paragraph without having had the opportunity of considering the whole report.

Sir Frederick Hopkinson.—If I was not addressing a Judge of the High Court, I should say that you were fencing with the question.

Chairman.—We have got from Sir Lawless Hepper that the Development Directorate Reports were not candid and that there were material omissions. I think Sir Lawless Hepper has been very fair in his answers?

A. I cannot say anything about that; I have no personal knowledge.

Q.—We have it from Sir Lawless Hepper. I do not think we really need ask you about it. He is the author of the document, and he admits it is not true?

A.—You understand my natural caution in not giving an opinion on a single paragraph without being aware of the whole report. I should only like to add this—that in addition to those reports the Development Department was very fully discussed from time to time in the Legislative Council, and I think it would be well to examine the Debates to see whether full information was not given in those Debates in the Legislative Council.

Mr. Billimoria.—I may mention that all we want is the whole truth, and I may point out the danger which would exist, in connection with one of your answers to our Chairman, if you were not to disclose the discussions which took place in the Executive Council. There would be the danger of an impression being left that there is something which somebody is attempting to keep back. All we want is nothing but the truth. There may be misapprehensions about certain points and certain matters, and if you were candidly to tell us everything you know about it, it would clear the atmosphere. We are not here to make insinuations against anyone; we only want facts. As home member I take it you were not concerned with the Development Department directly or indirectly, or with its activities?

A.—Not directly.

Q.—Were all matters of any importance concerning the Development Department discussed with the members of the Executive Council?

A.—Matters of prime importance must have been discussed.

Q.—On how many occasions; can you tell us?

A.—I could not tell you the number, but at the time of the Budget, the Development Department was considerably discussed—every year before preparing the Budget for the next year.

Q.—Is the impression left on your mind that the Department gave you candidly all the information which they had in their possession and that the Government were in the confidence of the Department?

A.—I have no reason to suppose that the Department did not give all the information required by the Government. By Department, do you mean the Directorate?

Q.—Yes.

A.—I have no reason to suppose that the Directorate did not give all the information required by the Government.

Q.—Did you see any of the reports published by the Development Directorate?

A.—The annual reports.

Q.—Did they give the correct information? Sir Lawless Hepper has admitted, in answer to my questions, that much more information could have been given which has not been given in those reports.

A.—I cannot say.

Q.—In answer to one of the questions with regard to the memorandum you were good enough to submit this afternoon, you spoke of some congested area. Did you ever expect that people living in that congested area would transport themselves to the reclaimed area? Were they the class of people who were going to live in that area, paying 400 to 600 rupees monthly rent, when their income for the year did not amount to that?

A.—The better classes have been steadily moving out of the city to the better quarters of Bombay. No doubt those classes would move out to the reclaimed area, just as the still richer classes have moved out to Cumballa and Malabar Hills. They would, to that extent, afford more room in the congested areas.

Q.—How was this scheme, therefore, going to help the poorer classes—in what direction?

A.—The more people who moved out of the congested area, the better.

Q.—But how was it going to help the poorer classes?

A.—By leaving vacancies for them.

Q.—Do you mean to say that a man living in a 10 foot by 10 foot room would go and occupy the whole of a flat in a building? No doubt if he could afford to pay the rent he would, but if his income remains stationary, how is he going to shift into these palatial buildings? How is a man, at present living in a chawl, going to occupy a flat? Is that the idea?

A.—It is not my idea, no; but you understand there is a gradual movement. The richer classes move out into the better areas, the middle classes move into theirs, and the middle classes vacate buildings which are occupied by the other classes.

Q.—That all happened because Bombay was prosperous after the war. A lot of money flooded into the country, and people did not know what to do with it?

A.—Not at all. I remember Bombay over 35 years ago, when there was hardly a single house on the sea face. Now along the whole of the Chaupati sea face there are most palatial residences, all occupied by well-to-do Indians. It began very much before the war.

Q.—How many such people do you expect would spring up year after year to occupy an area which would be reclaimed consisting of 1,145 acres, the reclaimed building area being 2,200,000 square yards of land? How many people would come and take that area? Would it not take years?

A.—I could not give you any estimate, but I know that building is going on very rapidly still in Bombay, and every year numbers of people move out into better buildings and better residences.

Q.—But that is a gradual and slow process?

A.—Not slow. It has been going on very quickly.

Q.—The reports of the Improvement Trust are far more disappointing. The last report indicates that they had to cancel several of the land contracts because people would not take up land and would not build?

A.—That is very likely at present owing to the depression of trade.

Q.—You spoke of vested interests. Who are those vested interests in the political parties which agitated about this?

A.—The vested interests are those of the landlords who own land and own chawls. They naturally do not want to see the value of their land and the value of their chawls for letting purposes go down.

Q.—How was it ever calculated that the value of land would go down? If there was a demand the supply was there and the prices must remain stationary. If there was no demand prices would never fall. Therefore where was the question of vested interests?

A.—If there is more land available and the demand is the same, the value of the land will go down.

Q.—But is there a demand for land?

A.—There was a very heavy demand.

Q.—Yes, because of the speculation, but ignore that boom period of speculation and come to normal times and tell me whether there was any demand, or if there is likely to be any demand in the near future.

A.—I think so. I think there was a normal demand, quite apart from the heavy speculation.

Q.—Which would have swallowed up the 1,145 acres of land?

A.—There is every reasonable probability of the land being sold gradually.

Q.—Gradually I quite agree, but there is no immediate prospect of a sale. It has been suggested by several people in Bombay that, with flourishes of trumpets the scheme was announced as yielding, at a very moderate estimate, a profit of 30 to 50 crores. Now the situation has changed, members of Government come forward and say that there is a large area that will be available which is an addition to the site of Bombay and beautifies the city. Is that the right view of the situation? You go and tell the public you are going to make a profit hand over fist of from 30 to 50 crores. Now, then you are faced with a tremendous loss, and you know that you are absolutely wrong in your forecast, you come forward and announce to the public that they must bear a little burden of taxation for the benefit of future generations?

A.—I am sorry I cannot admit the truth of your picture.

Chairman.—But did you tell them that the profit would be 30 crores?

A.—No; that is what I say. I cannot admit the truth of the picture.

Mr. Billimoria.—The statement I have made is not my own. It is a statement that was made openly on the floor of the House by the Member responsible and in charge of the Government. I am sure you are aware of that fact. It was a statement which was made and repeated with emphasis, that this scheme was going to be a very profitable venture and was going to yield a very handsome profit?

A.—I have already stated that it was hoped it would be profitable.

Q.—Now that it has proved otherwise, is it right for Members of Government to come forward and tell the public generally that they should bear the taxation and still carry on with the work? Is it prudent? Supposing you were a business firm, would you have gone to your clients and made that suggestion?

A.—I have already explained that it was not a commercial project in its essence. That was not the essence of the scheme.

Q.—That was the basis of the whole scheme?

A.—No.

Q.—The figures that were submitted to the Government of India were absolutely incorrect figures. That has been proved up to the very hilt. The Government of India were induced to embark on the scheme on the basis of 367 lakhs?

A.—The essence of the scheme was the relief of the congestion in the City of Bombay.

Q.—Based on what? Based on certain calculations. You know very well that the Secretary of State declined to sanction the scheme until the finances were provided for, and it was on the basis of 367 lakhs that the Government of India were induced to embark on the scheme. But for that they would never have sanctioned it. We had it this morning from a responsible Member of Government that if the figures had been otherwise they would have thought twice before sanctioning the scheme. I ask you, therefore, is it prudent now, as you have suggested in the course of your evidence, to still complete the scheme?

A.—I certainly think the scheme ought to be completed.

Q.—No matter what it costs? No matter what the subsequent results are?

A.—As results are now estimated, I think the scheme ought to be completed.

Q.—If it is going to cost you ten crores, and if the prospects of sale of land are far remote (it may take 50 years according to the evidence of the people who are concerned with it), with compound interest running into a loss of several crores, would you still recommend that the scheme should be completed?

A.—I do not admit your statements, but I have already said on existing facts I think the scheme ought to be completed.

Q.—On what facts?

A.—On those facts which I have already entered in my written statement.

Q.—It sounds very well on paper, but if you look at the figures, if you calculate the interest, and when you see that the prospective result is a tremendous loss, would you still persist in holding the opinion that the scheme should be completed?

A.—The figures I have entered in my statement have not been questioned.

Q.—To which figures are you referring?

A.—To the figures in my statement.

Q.—The figures given before us at present show that the scheme, if completed, is going to cost 11 crores, irrespective of interest and depreciation. If the land reclaimed is not sold, or is not likely to be sold, within the next 25 or 50 years, that figure will be more than doubled or trebled. Do you still suggest that the scheme should be completed?

A.—I cannot say any more than I have said in my general statement.

Sir M. Visvesvaraya.—There is one more point. Some of the leading citizens of Bombay, such as the President of the Corporation and the President of the Chamber of Commerce, were asked by Government to make a report as to how much of the work should be completed. They have recently reported that only three blocks out of eight should be completed and that the rest should not be taken in hand. In spite of that statement, do you still persist in stating that the work should be completed?

A.—Yes, certainly—gradually completed.

Q.—And not that it should be pushed through and completed?

A.—No.

Mr. Billimoria : That is what I wanted. That makes it perfectly clear.

A.—I am sorry I did not understand the trend of your question.

Sir Frederick Hopkinson.—One point which has come up is this. Here was a thing amounting to 1,145 acres. The average annual demand for land was 60,000 square yards. The question will arise whether it was wise to go and spend 702 lakhs and to pay 6¼ per cent. interest on that with such a limited anticipated requirement of land for the future, and whether it would not have been wiser to have done it piecemeal; as you finished a certain portion, to develop that and let it, and then, as you found you sold that land, to get on to the next piece. If you complete your scheme for 702 lakhs, you have that interest accruing year after year at compound interest. The question arises as to whether that was not one of the grave faults of the whole scheme?

A.—I cannot say. I am not personally aware of those details, but I have said that I think it ought to be gradually completed.

Sir M. Visvesvaraya : It will eventually be completed no doubt. Having spent so much money it must at some time or other be completed.

A.—In the circumstances as they now are I think it ought to be gradually completed.

Q.—But we are to proceed with caution at present?

A.—Yes.

Mr. Billimoria : It has been very bitterly complained of in Bombay that the public were not taken into confidence. Honourable Members of Council, including the representative of the European Chamber, have complained about it. Have you any remarks to offer as to why they were not taken into confidence?

A.—I have already said that the Development Department was very freely discussed from time to time in the Legislative Council.

Q.—If you make that statement, I might point out that several members who have given evidence here have stated that the Budget discussion on this particular item was left over to the last and that only five or ten minutes were allotted by Government to it. They say that they had hardly any opportunity to discuss such a vital issue, and that they were not given, as a matter of fact, any opportunity, except on the last occasion, when half an hour was given to them. If you like I will read out the passages.

A.—I can explain that entirely. A certain number of days only were allotted to Budget discussion, and at first a good deal of time was wasted over petty items such as five rupees and ten rupees. The Council had not realised the importance of concentrating on the large items. Hence at the first Budget meeting of the Legislative Council it did happen that the time was mostly wasted over small items which really did not matter much, and there was no time for the very much more important items, such as the Development Department. The consequence was that in later Budget meetings we decided to reverse the order in which the items of the Budget were discussed, and we purposely put the Development Department first; we began from that end of the Budget in order that there should be full opportunity for the matter being fully discussed in the Legislative Council.

Q.—That was when you saw the grave situation. That is when you were faced with a terrible loss and with the failure of the scheme?

A.—No, that was on general principles—that the Council ought to be encouraged to discuss the important parts of the Budget in the Legislative Council.

Q.—The suggestion of some of the witnesses has been that when Government was faced with a difficulty they gave the opportunity of discussing it, and even then only half an hour was allotted?

A.—That is quite wrong. The reason was to give the Council full opportunity of discussion, and without regard to any particular situation. I can say that because I personally am aware of it. Being Leader of the House I had a personal hand in saying that the House should have full opportunity of discussing every part of the Budget.

Q.—That is very satisfactory. Was that announced in the House?

A.—Yes.

Q.—It was so stated?

A.—Yes.

Q.—Then how does the belief still remain otherwise?

A.—I can only refer you to the Debates of the Legislative Council. I think I am correct in saying that as Leader of the House I got up and explained particularly why we arranged on that particular occasion to discuss the Budget upside down, beginning at the bottom, so that important matters might be discussed at all events by the Legislative Council.

Q.—Therefore I need not trouble you with the various remarks made by Members of Council who have given evidence, suggesting that no opportunity was afforded to them?

A.—I do not think so.

Q.—When did Government for the first time realise that this was going to be a financial loss?

A.—I cannot say the exact date.

Q.—When did they first become aware of the failure of the dredgers?

A.—You mean that the dredgers were not producing as much mud as was expected?

Q.—Yes.

A.—I cannot give you the exact date when that was known in the Development Department.

Q.—Is it your impression that directly it came to the notice of the Department the Government were told all about it, or were the Government kept in the dark?

A.—The Development Department is a Department of the Government.

Q.—Not of the whole Executive Council?

A.—It is a part of the Government. I think as soon as it was proved that the dredger was not working up to what had been expected of it, the matter was known to all Members of Government.

Q.—What action did the Members of Government then take on that?

A.—The matter was under observation. Enquiries were being made, to the best of my recollection, in the Development Department as to the reasons why the dredger was not giving satisfactory work. To the best of my recollection, enquiries were being conducted in the Development Department.

(The Witness withdrew).

The Committee Assembled at 11 a.m. on the 1st October, 1926, all the Members being present.

45th Witness, Sir Chimanlal Harilal Setalvad, K.C.I.E.

WRITTEN STATEMENT.

At the outset I must make it clear that the Back Bay Reclamation Scheme was finally sanctioned by the Government of India, and the Secretary of State, as part of a Comprehensive Scheme for the development of Bombay and its suburbs, the Development Department had been organised, Messrs. Meik and Buchanan had been appointed engineers, and the dredger had been ordered, long before I assumed office on 3rd January, 1921, as a Member of the Executive Council of the Governor of Bombay. When I joined the Government, Sir George Curtis was in charge of the Department, and continued to be so for some time longer, till, in the redistribution of work in the Reformed Constitution, by the Governor, I was put in charge of the Department. I resigned office on June 16th, 1923. The Dredger "Sir George Lloyd," had then just arrived, but began working several months after I left office. Till then the construction of the retaining wall and other work had proceeded quite within the estimates as to time and expenditure. I cannot, therefore, throw much light on questions one and two, formulated by the Chairman, at the first meeting of the Committee in Bombay. But I think I can place before the Committee certain facts and circumstances concerning the undertaking of the scheme of which I have knowledge.

It must be remembered that the reclamation of part of the Back Bay is a very old idea. It was first undertaken in 1864 by a private company, which came to grief, but which added a considerable area to the island of Bombay, the land comprising the Chowapite frontage and the Charni Road. As the trade and industries of Bombay expanded, the desirability of reclaiming a portion of the Back Bay came up from time to time for consideration. The question was seriously considered during the administration of Lord Sydenham in 1911. Then, if I remember rightly, even a more ambitious scheme than the present one was proposed. The idea was further considered under the administration of Lord Willingdon. The report of the Development Committee of 1915 shows that the position as regards accommodation for offices and housing was even then felt to be acute. When the present scheme was proposed by the Government of Bombay and was

sanctioned by the Government of India and the Secretary of State in 1919, it was therefore not a new scheme, but the carrying into effect of an old project.

Further, the action of the Government of Bombay in 1919 must be judged by the conditions then existing in Bombay, and not by present conditions. There was a great hue and cry in those days about want of accommodation both for residential as well as business purposes. It was impossible to get decent residential bungalows except at ruinous and prohibitive rents, and it was even more difficult to obtain offices and business premises, for which fabulous rents had to be paid. I have known of a premium of a lakh of rupees having been paid on the sub-letting of shop accommodation. In those days land on Hornby Row was being sold in the vicinity of Rs. 1,000 per square yard, and in one or two instances as much as 1,200 and 1,400 rupees per square yard was paid. For the Worli foreshore estate of the City Improvement Trust, at the north end of the city, an offer was made by the European Association to take up part of the area at an all over rate of 50 rupees per square yard. This offer was at the time considered very inadequate, and the Municipal Corporation of Bombay recommended that the offer should be rejected. I believe another offer for taking over the whole area at Rs.70 per square yard was also rejected.

It was urged that the Trade and Commerce of the City was being strangled by the lack of accommodation, and the cry was insistent for provision for sanitary housing for the industrial and working classes as well as for areas for factories. It was under these circumstances that the Government of Bombay decided to embark on the Back Bay Reclamation scheme, the development of the suburbs, the creation of industrial areas for factories, and the erection on a large scale of tenements for the working classes. This comprehensive scheme was examined and approved by the Government of India and the Secretary of State, who must share with the Government of Bombay the responsibility for the same. It was not a scheme undertaken for making money by land speculation, but was undertaken as a necessity for providing the necessary accommodation for the expanding trade and industries of Bombay, and for securing sufficient residential accommodation for its increasing population. The scheme, I believe, received general support at the time and was approved by the legislative Council.

While it is true that the estimates have gone wrong as regards the dredging part of the scheme, it is not right to judge of the necessity or the desirability of the scheme when it was decided upon by the very exceptional circumstances now existing in Bombay. The trade and industries of Bombay are at present at a very low ebb, and the depression following an unprecedented boom has been so deep and has continued so long, that the people in Bombay have become very pessimistic. In addition to this general pessimism, an influential body of persons who themselves acquired land at high prices during the boom, and who have lost heavily by the depression in the property market, are apprehensive of further diminution in the value of their land holdings if more land is made available by the reclamation. With them are allied certain politicians who want to make the most of an opportunity to abuse the Government, and who do not hesitate to make wild statements and charges without any foundation for the same. These causes have combined to make the outcry against the Back Bay scheme so loud and so insistent. The campaign of attack has further been stimulated by a personal element, viz., the unpopularity that Sir George Lloyd had incurred, during his administration, with certain sections of the people.

I think the above combinations of circumstances is responsible for such outcry as there is against the project. Comparatively little, if anything at all, has been said about schemes in India and elsewhere where the original estimates have been very much exceeded. It is true that the original estimate of 4 crores, for the reclamation, had to be raised to 7 crores It is, I understand, now considered that the scheme would cost 11 crores and more. It must be remembered that although the land produced by the reclamation may not be immediately sold, it will be available for Bombay, as it is bound to expand in the coming 15, 20 or 25 years ; and I anticipate that Government would get back all the money spent on it. According to the original estimates the reclaimed land was expected to be produced at the cost of 10 rupees per square yard. On the revised estimates, I believe, the cost went up to 18 rupees or more. But taking the most pessimistic view, and allowing a long term of years for interest and sinking fund, the cost of the reclaimed land may go up to say, 60 or even 70 rupees per square yard. I venture to think that that land would fetch at least that price and possibly more. Even with the present very depressed state of the land market in Bombay, a few months ago land on Hornby Row was sold at a forced sale under a mortgage for over 500 rupees per square yard. For the Military lands at Marine Lines that are in the market, I know an offer was made for the whole area at 100 rupees per square yard. It is not too much to expect that the Back Bay Reclamation land, so near the business quarter, will fetch anything from 70 to 100 rupees per square yard.

The requirements of Bombay in the near future and the beneficial use to which the reclamation land can be put, must not be ignored. Under the new organising of the Navy,

the Director of the Royal Marine and his Staff will disappear, to be replaced by R.I.N. Officers of comparatively junior rank, who can be accommodated in two blocks of flats in block number 8. With the removal of the R.I. Naval Staff to Colaba, the whole of Campbell Park and the Director's bungalow and compound will be available. Bombay can then have at once the much-needed site for a Council Hall and other requirements. Similarly the Mint can be located at Colaba and the present valuable site occupied by the Mint made available.

Further, the Government of India will require space for other establishments. Bombay has no Quarantine Station, and in all probability in a few years you will have yellow fever knocking at your doors. The only possible site for a Quarantine Station is Butcher Island, at present tenanted by the wireless. The wireless can be located at Colaba, and Butcher Island thus made available for a Quarantine Station. It must not be forgotten that mainly because of the great shortage of building sites in Bombay, Indian Chiefs are debarred from purchasing real estate in the city. If more residential land is made available this prohibition which, at present, is resented and causes considerable heartburning, can be removed. I think that there cannot be much doubt that there is sure to be a growing demand for houses as favourably situated as those on the reclamation will be. It is not right to treat the reclamation merely as a commercial speculation. It was never intended as such, but was launched as part of a large scheme for the development and sanitisation of a very big and growing city like Bombay.

On a proper appreciation of the considerations set forth above will depend in a measure the decision as to what is the best thing to do about the scheme. The Colaba end block, part of which has been sold to the military authorities, must be completed, so must, I think, be the Marine Lines end blocks. The work on the middle blocks may be delayed, but things should be so arranged that the work may be undertaken as and when suitable opportunities may arise. I consider that, whatever view may be taken as to the desirability of the inception of the scheme, the only sensible course is to finish it. The cry that the whole scheme should be scrapped and the money spent on it till now be lost, is absurd. Any private individual or Company who had sunk in such a scheme the amount of money that the Government of Bombay have spent, would, if they could afford it, complete the scheme, and wait for better times for recoupment. In the case of the Government of Bombay, with its annual revenue of about 14 crores, it is much the wisest course to complete the work. As regards the portion of the Colaba end block, agreed to be sold to the Military authorities, I believe at about 20 rupees per square yard, an irrevocable loss would be made on that area, as the cost has now gone up. But I suggest that an effort should be made to readjust the terms of the agreement, as the purchaser in this case is not a private individual, but the Government of India. The agreement was entered into on the footing that the land would be produced for about 17 rupees per square yard, and I believe in the negotiations the Government of India had urged that as the land was required for Government purposes it should be given almost at cost price. It is equitable that the Government of India should, under the altered circumstances, not hold the Government of Bombay strictly to the bargain, but pay the actual cost of the reclamation. It is not unreasonable to ask the Government of India to agree to this, because they will be satisfying all military requirements in Bombay, and securing efficiency and better health of the troops, by concentration on the reclamation land, and thereby be able to sell their Marine Lines Estate, originally acquired at a very low value, for considerable profit, even in the present depressed land market in Bombay.

I see from the reports of the proceedings of the Committee that reference has been made to what I stated in the Legislative Council in February, 1921, as regards the expected financial results of the Back Bay Reclamation Scheme. As I have said, in January, 1921, when I joined the Government of Bombay, Sir George Curtis was in charge of the Development Department, and continued to be so for some time further. The Legislative Council Meeting was held in February, and the Statement that I then made was taken entirely from figures given to me by Sir George Curtis. But there is no mistake or ambiguity about the figures I gave. The estimated cost per square yard was then 10.15 rupees; 1,100 acres was the area of the land to be reclaimed, out of which 400 acres was to be absorbed in roads and open spaces, leaving a balance of 700 acres available for residential purposes. An acre roughly comprises 5,000 square yards, so the area available was 35 lakhs square yards. Taking the then prevailing values of land in the vicinity, the expectation that this land might fetch at least about 110 rupees per square yard, if not more, was, under the circumstances, not extravagant. If so, the profit on the reclamation land, if sold as soon as produced—and that was what the then demand indicated—would have been, as stated, 30 crore rupees.

In this connexion it may be mentioned that one or two private syndicates and companies had offered on certain terms to take the concession for reclaiming the Back Bay before the Government took up the undertaking. Later, when the scheme was being

carried out by the Government, I remember, in 1922, when I was in charge of the Department, a leading financier in Bombay approached the Government with a proposal to hand over the reclamation to a syndicate he was prepared to form, such syndicate paying at book value all the money spent by Government till then, and taking over all liabilities incurred, including the price of the dredger, for which the order had been placed, and in addition paying a sum of 2 crores as profit to the Government. I am mentioning this to show how, even at that time, the reclamation was considered a good business proposition. An offer of Rs.25 lakhs for what is called the Battery Site, comprising roughly 5,000 square yards, was rejected by the military authorities in 1922 as very inadequate.

The scheme was not undertaken or attempted to be justified on the ground of the anticipated profits. It was considered necessary and desirable to produce the land in order to meet the large and growing demand for residential and business accommodation, and the anticipated profits were incidentally mentioned as a feature of the soundness of the scheme. Circumstances have so terribly altered that all anticipations have been upset; but, as already observed, I fully expect a great expansion and prosperity for Bombay in the future, when the Back Bay Scheme and those who inaugurated it, will receive some recognition and appreciation.

London, 28th September, 1926. C. H. SETALVAD.

ORAL EVIDENCE.

Chairman.—You have been good enough to furnish us with a written statement and that will form part of the record in the Appendix. You point out at the outset that the Back Bay Reclamation Scheme was merely part of a comprehensive scheme for the development of Bombay and its suburbs?

A.—That is so.

Q.—Indeed the Development Directorate had a large number of other matters to attend to other than and beyond the Back Bay Reclamation Scheme?

A.—That is so.

Q.—The Back Bay Reclamation Scheme, if carried out successfully would have given 400 or 500 acres of land available for business or high-class residential premises?

A.—I think more than that—about 600 or 700 acres.

Q.—Had the estimate of profit been realised that money would have been available for the amelioration of the poorer classes or for any purposes that the Government thought would benefit the city and Presidency?

A.—That is so.

Q.—On 3rd August, 1920, which was the date of the announcement of the creation of the Development Directorate, what position were you occupying?

A.—I had then nothing to do with the Government. I was then, as I am now, a practitioner in the High Court.

Q.—You did not become a Member of the Government until the 3rd January, 1921?

A.—That is so.

Q.—What position had you in the Government then?

A.—I was called the General Member, but the expression General Member does not really correctly signify the duties that I had to perform. I was called the General Member and I do not know why that designation was adopted, but I was in charge of specific departments. For instance, I was in charge of the Legal Department, I was in charge of the Irrigation Department, the Marine Department, the Development Department, and so on.

Q.—Were you in charge of the Development Department from 3rd January, 1921?

A.—No, as I have said in my statement, Sir George Curtis was then in charge of the Department. I cannot tell you exactly the date at which I took over, but it must have been somewhere in February that I took over.

Sir Frederick Hopkinson.—Which year?

A.—February, 1921.

Chairman.—Had you before that date studied the report of Mr. Kidd?

A.—No, I do not think I had seen it before that.

Q.—Had you before that date studied the report of Sir George Buchanan?

A.—I do not think I had.

Q.—Naturally you had a certain amount of general information about the matter?

A.—As a citizen of Bombay, yes.

Q.—In February, 1921, or immediately thereafter, I suppose you did read the report of Sir George Buchanan with care?

A.—Yes, I did look into the papers after I took over.

Q.—At that date was there anything which caused you uneasiness?

A.—I do not think it did. It must be remembered that when I took over and then read the papers it was merely with a view to enabling me to carry on what had already been decided upon. I was not then called upon and never considered it my business to decide for myself whether this scheme should or should not have been inaugurated. That was not for me.

Q.—The position was that the scheme had been already definitely decided upon?

A.—Yes, and the work started already before I had taken over.

Q.—The work was in progress?

A.—Yes.

Q.—If, however, there had been some matters which caused you uneasiness you would have brought them to the attention of the Director of Development Directorate and your colleagues?

A.—I would certainly have done so, but you see at that stage there was nothing to create suspicion in my mind about the scheme, because so far as the engineering part of it was concerned I was bound to accept what the experts had done; and even now as I conceive the position to be, all that has failed really is the dredging operation part of it. The construction of the wall and the rest of it, as I have said in my statement, was done quite within the time and the money estimated when I took over.

Q.—The estimate, as we know, was for 367.61 lakhs?

A.—Yes.

Q.—Shortly after the creation of the Development Directorate Mr. Lewis began to prepare a revised estimate?

A.—That is so?

Q.—Which came to 702 lakhs?

A.—Yes.

Q.—In the interval between the 367 lakhs estimate and the 702 lakhs estimate the Reform Constitution came into being?

A.—That is so.

Q.—In fact and according to the legal view that was taken, the increased estimate of 702 lakhs was not officially brought to the attention of the Government of India?

A.—I am not sure about it but very likely that is so. It was brought before the Legislative Council who had to sanction the budget under the new Constitution.

Q.—That is true.

A.—In that way, of course, having been brought before the Legislative Council, the proceedings of which were sent up to the Government of India in ordinary course, it cannot be said that they were not cognisant of it.

Q.—That is true.

A.—I quite agree that it was not officially sent up to them.

Q.—For sanction and approval?

A.—Quite so.

Q.—That was because of the circumstance that by the time the 702 lakhs estimate came into existence the Reform Constitution was working?

A.—Yes, and I may say that that was the view, if I remember rightly, that was taken of the Constitution, both by the Secretary of State and the Government of India; because with regard to another scheme, the Sukkur Barrage Scheme, the scheme had been sanctioned by the Secretary of State and the Government of India, but after the Reform Constitution the Government of Bombay were told: "Now although we have sanctioned it you must place it before your Legislative Council and obtain their assent." That was the view taken by all the authorities, that it was the business of the Legislative Council to look into and sanction the moneys wanted for the progress of the schemes.

Q.—I do not think that there is any doubt as to the propriety of the action taken. I merely want to get it on the record quite simply?

A.—Quite so.

Mr. Billimoria.—Merely because the Secretary of State suggested that the Sukkur Barrage Scheme should be carried on by the Government of Bombay, without reference to him, did that mean his approval and sanction were not necessary—that may have been an additional check?

A.—They had, of course, approved the Sukkur Barrage Scheme. There was no question of his approving it again, but he said: "Now you have superimposed the new Constitution and therefore you must go to the Legislative Council."

Q.—Did the reforms preclude the Secretary of State and the Government of India from taking any part in any question of local government?

A.—No, not in the least. The legal control of the Secretary of State and the Government of India was still there and is still there.

Q.—It is still there, you say?

A.—It is still there in law but the convention always has been understood to be, after the new Constitution, that as far as possible the Secretary of State, with regard to his functions, will not exercise control in exactly the same manner in which he used to do it before the Reform Constitution, and again similarly in the case of the Government of India with regard to the local Governments. That was part of the convention under the Constitution—the Joint Parliamentary Committee put this on record—which the authorities were expected to establish.

Q.—You will agree with me that under the reforms the powers of the Governor were curtailed rather than enhanced. He had not greater powers than what he actually exercised before the reforms came into being?

A.—I do not follow your question.

Q.—What were the powers of the Governor under the reforms? Were they the same as before the reforms?

A.—You cannot answer that in a general manner because under the new Constitution you had the powers of the Government in the reserved subjects and transferred subjects. With regard to the transferred subjects the effective power was supposed to be vested in the Ministers taken from the elected members of the Council. With regard to the reserved subjects the Constitution still remained the same, that is the Governor in Council was responsible for the administration of those departments.

Q.—Without reference or supervision or control by the Government of India?

A.—No, as I say, with regard to the Government of India and the Secretary of State, the legal control was the same with regard to all, even for transferred subjects, but the understanding was, the convention was, that with regard to those subjects that were transferred neither the Government of India nor the Secretary of State would continue to exercise the same amount of control, though it had it still in law, as they did before. That was the only way in which you could work the transition period of this Constitution.

Q.—I am raising this point because it has been suggested that the Government of Bombay did not act constitutionally in this matter?

A.—I would like to know what the suggestion is. How is it suggested that they acted unconstitutionally?

Q.—That they did not go to the Government of India or the Secretary of State to have the revised estimate approved and sanctioned.

A.—I do not think it was necessary.

Q.—Under the Government of India Act you think it is not necessary?

A.—No; under the new Constitution which was established and the conventions which were suggested under it, if you went to the Legislative Council and they approved of the expenditure to be incurred on revised estimates, it was thought that was enough.

Mr. Billimoria.—I am sorry, Mr. Chairman, if I have interfered, but that was a point which was suggested in your absence, namely, that it was not constitutional. As a Member of the Government Sir Chimanlal Setalvad would know about that and as an eminent lawyer he would understand the position.

Chairman.—Quite so. How long have you been resident in Bombay?

A.—I have been resident in Bombay more than 30 years.

Q.—We have been told that there was a growing immigration into Bombay and that the population rose in a few years from something like 800,000 to 1,200,000?

A.—And further, to 1,500,000, I think.

Q.—During the war to something in the neighbourhood of 1,500,000 people?

A.—Yes.

Q.—What was the condition of the housing of the poorer classes?

A.—The condition of the housing of the poorer classes was deplorable.

Q.—Were there many places in which more than one family were living in one room?

A.—That was so, and that is so even now with regard to certain tenements.

Q.—Was the overcrowding of the poorer population one of the most pressing social problems of Bombay?

A.—It was.

Q.—A matter which excited everyone's gravest concern?

A.—Gravest concern, and if I remember rightly the Secretary of State had rather pulled up the Governmnt of Bombay about it, and required that they should take measures to grapple with that problem immediately.

Q.—In the report of the Bombay Development Committee of 1914, page 58, Mr. Kissan, in his statement, speaks of the census of 1911, and even then according to the

official figures, out of the population of 929,082 people, 743,247, about 80 per cent. of the total population, were living in 166,337 one-roomed tenements?

A.—That is so.

Q.—That was as far back as 1911?

A.—Yes.

Q.—Between 1911 and 1918 had there been any increase in building sufficient to accommodate the other 500,000 or 600,000 who came into Bombay?

A.—No, the situation got much more accentuated as time progressed.

Q.—You could hardly have a worse situation than existed in 1918?

A.—That is so.

Q.—How do you describe it in 1918?

A.—I think it was worse than in 1911.

Q.—Far worse?

A.—Far worse.

Q.—One of the functions of the Development Directorate was to build some 50,000 chawls?

A.—Yes.

Q.—Which is the local name for a single tenement?

A.—Yes.

Q.—We know for reasons into which we need not enter here, which are not within the scope of our inquiry, about 16,000 tenements have been built and a very large number of them are not inhabited?

A.—There are very obvious reasons for it; may I state them very shortly?

Q.—Just tell us about it?

A.—One difficulty is the Rent Act, by the operation of which in the old insanitary chawls where the workmen live two or three families in a room, they pay only 5 or 6 rupees for a room. As long as they can remain there at those rents, which will not be the rents even at this time of these insanitary places if the ordinary law of demand and supply operated, they will never move into better sanitary places at a higher rent. That is one difficulty. The other difficulty is this. To my mind, if the destruction of some of those slums had been undertaken along with the construction of the new chawls, as it was at one time intended, then these people would have been obliged to move into better places. That has not been undertaken on the scale on which it was intended at one time.

Sir Frederick Hopkinson.—Could they have afforded to pay the new rent of the new chawls?

A.—Easily, looking to the great increase in the wages of the working classes, who really have fared much better during and after the war than any other classes. It is the middle class that has suffered the most. They could easily afford to pay the increased rent. They spend much more in drink, they spend much more in other useless luxuries, and they could certainly afford to pay increased rent to live in sanitary places, but they do not realise the importance of sanitation and they have really, in a sense, to be forced to do it.

Chairman.—I think you took the view that Bombay might be visited by such a thing, for instance, as yellow fever?

A.—We have been dreading that for some time with the increased communication between the countries where you have it and Bombay. When I was in Government I remember the Government of India were rather insistent about our creating a quarantine station.

Q.—Returning to Back Bay, you have made it perfectly clear that you had nothing whatever to do with the inception of the scheme?

A.—Nothing whatever.

Q.—But you came into office at a time when the work was commencing?

A.—Yes.

Q.—In your statement you mention that the reclamation of Back Bay has been a project considered since the year—you mention 1864 but it is really 1863?

A.—I may be wrong there.

Q.—I think as a matter of fact the date was 1863?

A.—Yes.

Q.—Are you sufficiently acquainted with the general history since 1863 to be able to say that the attitude of the Government of India was always one of caution?

A.—That is what I generally know. I cannot go further than that.

Q.—I ask you generally?

A.—Yes.

Q.—That the attitude of the Government of Bombay was always optimistic and eager for reclamation?

A.—I believe that is so.

Q.—It was not unnatural, because it was the Government of Bombay who felt the pressure of the existing conditions?

A.—Yes, and they were more acquainted than the Government of India with the local conditions and difficulties.

Q.—In 1919 was there a great difficulty in getting residential and business premises in the neighbourhood of the Fort?

A.—Absolutely. As I have said in my statement, I know a case where a premium of a lakh of rupees was paid for obtaining business premises.

Q.—That is somebody was prepared to put down £7,500?

A.—Yes.

Mr. Billimoria.—You have not mentioned any name. Can we have the name of the party?

A.—Yes, if you want the names. I cannot remember the name of the person who paid that or who offered to pay it, but the premises were then occupied by the Central Bank. If I remember rightly it was Macropolo, the tobacconist, who was being turned out from his place. He wanted a shop and he offered to pay or did pay—I am not sure—a lakh of rupees as a premium if he could get these premises, besides agreeing to pay the rent that the landlord was to get.

Q.—Do you say a tobacconist like Macropolo agreed to pay a lakh of rupees?

A.—I do not know what your question suggests. Do you doubt the fact? I know it is a fact.

Q.—That Macropolo was offering to pay a lakh of rupees?

A.—I am not sure whether it was Macropolo or somebody else, possibly it was somebody else. There is no doubt about the fact, however, because I saw the papers about it at the time. You need not merely rely on that instance, it is a well known fact in Bombay that people could not get premises at all.

Q.—Was it not because of the Rent Act? People could not get premises because the Rent Act was in existence. If the Rent Act had not been there the accommodation was available for people shifting from one place to another?

A.—Yes; but then the accommodation would have been available at rents which it would never have paid any business man to pay. You start with a shortage of premises which made it possible for the rents to be increased. Why were the rents increased? Because there was much more demand than the supply.

Sir Frederick Hopkinson.—We have been told that the rent of a flat in Bombay is as high or higher than it is in the West End of London?

A.—Yes; I find that you can live in London, as far as accommodation is concerned, cheaper than you can do in Bombay.

Mr. Billimoria.—That has been so for years. It was not a circumstance in 1919 alone. That has been so for the past several years?

A.—No; it got very much more accentuated about that time. The rents increased by leaps and bounds.

Q.—The comparison of rent between London and Bombay is not only then. Bombay and Calcutta have always been higher than rents in London?

A.—I do not think that was so before the War—no.

Chairman.—You say in your statement: "In those days land on Hornby Row was being sold in the vicinity Rs. 1,000 per square yard, and in one or two instances as much as Rs. 1,200 and Rs. 1,400 per square yard was paid for it."

A.—That is correct..

Sir M. Visvesvaraya.—That is quite true.

Mr. Billimoria.—That is only one instance?

A.—That shows how the market stood at the time.

Chairman.—The scheme, as you mention at the top of page 2 of your statement, was examined and approved by the Government of India and the Secretary of State?

A.—Yes.

Q.—You say: "Who must share with the Government of Bombay the responsibility for the same."

A.—That is so.

Q.—The Government of Bombay and the Government of India would naturally be very largely in the hands of Sir George Buchanan?

A.—Do you mean the Government of Bombay?

Q.—Let us take first the Government of Bombay. The Government of Bombay, who had invited Sir George Buchanan to make a report, would be very largely in his hands?

A.—Certainly, because he, or rather his firm, were to be the engineers in charge, and they were being paid a very handsome commission on the whole scheme.

Q.—Was there anybody in the Government of Bombay, any man in the Public Works Department, who had sufficient experience of reclamation on an open sea front?

A.—No; none had. That was the reason why Sir George Buchanan's services had to be engaged.

Q.—Similarly, when Sir George Buchanan went to Simla or Delhi and saw Sir Sydney Crookshank, Sir Sydney Crookshank would equally be in the hands of Sir George Buchanan?

A.—So he would be.

Q.—Do you know if Lord Lloyd ever consulted any expert other than Sir George Buchanan?

A.—That is more than I can say, because all that was done before I joined the Government.

Q.—My question is: Do you know? And the answer is No?

A.—No.

Q.—Do you know whether the Government of Bombay ever called into consultation any expert other than Sir George Buchanan?—

A.—No.

Q.—Do you know if in fact the members of the Government of Bombay ever had Sir George Buchanan in consultation with them?

A.—I cannot say anything about that because all that must have happened before I joined the Government.

Q.—At page 2, in the third paragraph, you are expressing the view that the project should be carried through, in effect?

A.—Yes.

Q.—While it is true that in 1919 and 1920 there was a great boom in Bombay, that time has been succeeded by the slump?

A.—Yes.

Q.—Which unfortunately has held on for a very long time?

A.—Yes.

Q.—Is it your view that that slump is always going to continue?

A.—No; I do not expect so. It never has been so before. It could not be in the ordinary nature of things.

Q.—Assuming that the whole of the land were reclaimed, you anticipate in your statement that you would get on an average from 70 to 100 rupees per square yard if you held on to it for a sufficiently long time?

A.—That is what I believe.

Q.—Of course, one matter that would have to be considered by a business Government would be the accumulation of interest?

A.—That is quite true; but what I say is, taking all that into account, if the land costs you 70 to 100 rupees to produce—I do not think it would cost as much as that, but supposing it does—you will get back all your money.

Q.—You think that even on the basis of reclamation plus interest and all proper working charges, working it out at 70 rupees——

A.—At the time of disposal finally.

Q.—Do you think there will come a time when it can be disposed of at that amount?

A.—I should think so.

Q.—You say the Colaba portion—part of which has been sold to the military authorities—must be completed?

A.—Yes.

Q.—And you make the suggestion that, in the altered circumstances, the Government of India should treat the Government of Bombay generously in the matter of payment?

A.—Yes.

Q.—I should just like to deal with that. The agreement between the Government of India and the Government of Bombay was that the Government of India should pay 20 rupees per square yard?

A.—That was then estimated to be roughly the cost of production.

Q.—Just say Yes to that question?

A.—Yes.

Q.—Was the estimate of cost at that time taken to be 17 rupees a yard?
A.—Yes.

Q.—So that would show a small profit of 3 rupees a square yard to the Government of Bombay?
A.—That is so.

Q.—So the argument is in your view, I suppose, that as the Government of India must to some extent share the responsibility for the undertaking, that it would be only fair of the Government of India to pay for that land what turns out to be its proved cost?
A.—The actual cost of production; that is so.

Q.—Now you say (I am reading on page 3): "The work on the middle blocks may be delayed, but things should be so arranged that the work may be undertaken as and when suitable opportunities may arise." By the middle blocks, do you mean blocks 3, 4 and 5?
A.—I do not know exactly how they are numbered. The Colaba end is 8?
Q.—Yes; there are eight of them and the Colaba end is 8.
A.—The marine line end is blocks 1 and 2?
Q.—Yes.
A.—They should be completed.
Q.—1, 2, 7 and 8 have been discussed a good deal?
A.—Yes.

Q.—Would you leave out 3, 4, 5 and 6—is that what you mean by the middle blocks?
A.—That is what I mean.

Q.—If the work on those is to be held up indefinitely, it rather raises the question as to what is to be done with the £850,000 worth of dredging plant?
A.—That would be lying idle.

Q.—Not only lying idle, but machinery of that kind, and the pipe lines especially, would deteriorate?
A.—Yes.

Q.—It would deteriorate very rapidly, and the pipe lines especially?
A.—Yes. My own personal view is that I would complete the whole scheme if it were possible to do so. I only suggest the slowing down in view of the exceptional circumstances.

Q.—You would complete the whole scheme, and I suppose you would complete it partly by dredging and partly by murum filling?
A.—Yes; that is a matter on which I am not competent to speak. Those who have studied the materials will be able to say.

Q.—At all events, if you are going to delay it you have got to decide what is to be done with that very expensive dredging plant?
A.—That is so.

Q.—If you are going ahead, then you use your dredging plant?
A.—That is so.

Q.—If you delay and dispose of your dredging plant, then ultimately 3, 4, 5 and 6 must be filled in by murum?
A.—Yes; if you get rid of your dredging plant, as possibly you may have to.

Q.—Then you say: "I consider that whatever view may be taken as to the desirability of the inception of the scheme, the only sensible course is to finish it. The cry that the whole scheme should be scrapped and the money spent on it till now be lost is absurd. Any private individual or company who had sunk in such a scheme the amount of money that the Government of Bombay have spent, would, if they could afford it, complete the scheme and wait for better times for recoupment. In the case of the Government of Bombay, with its annual revenue of about 14 crores, It is much the wisest course to complete the work." Are 14 crores £10,500,000?
A.—Yes.

Q.—The Government of Bombay has a great many calls on it?
A.—I agree.

Q.—I do not know of any Provincial Government in India that does not feel the pinch at the present day. Is not that so?
A.—Yes; in Bombay we want money for many purposes, I quite agree.

Q.—But still you are of opinion that taking the scheme at the stage which it has reached, and having regard to matters other than money, such as sentiment and the desire to beautify Bombay——
A.—And also its future utility.

Q.—And also the future utilities, when in the ordinary course of things you say the slump will give way to better times?

A.—Yes.

Q.—For all those reasons you are of opinion that the scheme should be completed cautiously?

A.—Yes.

Q.—Within a reasonable time?

A.—Yes.

Q.—Apparently, on the 28th February, in the Legislative Council, Rao Bahadur Chitale, criticising the scheme, said: "It is not for the benefit of the masses. The Back Bay reclamation is primarily for the classes." You, being then the Minister in charge, said: "I am quite prepared to answer the question put by Rao Bahadur Chitale, namely, whether the Back Bay Reclamation Scheme will be for the masses or for the classes. The land produced by the Back Bay Reclamation Scheme will certainly be for people who will pay for it, but Rao Bahadur Chitale will remember the 30 or 40 crores of rupees, the profit which will be realised out of that land that will be reclaimed, will be available for ameliorating the condition of the poorer classes. That money will be available to Government. That money will be available to this Council, and you can do anything you like with it for the benefit of the poor and the working classes." Thirty crores of rupees is £22,500,000?

A.—Yes.

Q.—The view you took then, I think, is set out in your statement, and I would like to read it?

A.—Yes.

Q.—You say: "I see from the reports of the proceedings of the Committee that reference has been made to what I stated in the Legislative Council in February, 1921, as regards the expected financial results of the Back Bay Reclamation Scheme. As I have said, in January, 1921, when I joined the Government of Bombay, Sir George Curtis was in charge of the Development Department, and continued to be so for some time further. The Legislative Council meeting was held in February, and the statement that I then made was taken entirely from figures given to me by Sir George Curtis." At that time, had you been in office for a few weeks only?

A.—Yes; in charge of the Development Department for a few days.

Q.—"But there is no mistake or ambiguity about the figures I gave. The estimated cost (per acre) was then 10.15 rupees."

A.—It should be "per square yard."

Q.—"The estimated cost was then 10.15 rupees per square yard; 1,100 acres was the area of the land to be reclaimed, out of which 400 acres was to be absorbed in roads and open spaces, leaving a balance of 700 acres available for residential purposes." Is that quite right? Were you not going to take out of that 700 acres a considerable portion for a recreation ground?

A.—That is all included in the 400.

Q.—So be it. Is the Military land included in the 700 acres?

A.—Yes; they were getting about 200 acres.

Q.—239 acres, we have been told?

A.—Yes. At that date the agreement with the Military to give them 200 odd acres had not been completed.

Q.—That is most important. In February, 1921, when you were speaking, you were speaking as a man able to deal with 700 acres?

A.—That is so.

Q.—You go on to say: "Leaving a balance of 700 acres available for residential purposes. An acre roughly comprises 5,000 square yards. Taking the then prevailing values of the land in the vicinity, the expectation that this land might fetch at least about 110 rupees per square yard, if not more, was, under the circumsances, not extravagant. If so, the profit on the reclamation land, if sold as soon as produced—and that was what the then demand indicated—would have been as stated, 30 crore rupees."

Q.—That is £22,500,000?

A.—That is so.

Q.—That was the calculation on which you made the statement?

A.—Yes.

Q.—And which at that time, and in those conditions, given the smooth working through of the Reclamation scheme, was in your opinion not unreasonable?

A.—It was absolutely correct, I think.

Chairman.—I am much obliged to you.

Sir M. Visvesvaraya.—The scheme for 367 lakhs was sanctioned before you took charge of your office?

A.—That is so.

Q.—When the estimate came to your notice, did you regard it as an approximate estimate, or as a final estimate?

A.—I think as an approximate estimate.

Q.—I may remind you that in the correspondence on the subject it was treated practically as a final or satisfactory estimate?

A.—For all practical purposes no doubt it was taken as final; but it was liable to some variations. I am not disputing that.

Q.—The first estimate you considered fit to be accepted as a reliable forecast of the probable expenditure?

A.—There were letters about it.

Q.—The Government of India stated : " We agree with the Local Government that it is desirable to add 10 per cent." The added 10 per cent., making it 400 crores?

A.—Yes.

Q.—With the addition of 10 per cent., the estimate came to 4 crores; and they added : " We think it can be carried out for this sum." They thought at the time it could be carried out for that sum?

A.—No doubt that was then what was considered to be the sum required.

Q.—When you entered office had they begun to revise the estimates, and prepare another detailed estimate?

A.—I think so, though the revised estimates came to me later—Lewis was asked to prepare revised estimates.

Q.—I want to know whether when they started the work, they thought that the details were all complete, or that a lot of work had to be done and the estimates might be exceeded?

A.—That is more than I can say.

Q.—You were not in charge at the time?

A.—No.

Q.—You know that the estimate has gone up to 702 lakhs?

A.—Yes.

Q.—That was sanctioned a few months after you came?

A.—That was put before the Legislative Council.

Q.—Again you probably know that the present cost is estimated at about 10 crores?

A.—10 to 11 crores, as I understand.

Q.—10 crores is the latest estimate. We understand things are more favourable than they were last year?

A.—Yes, I understand that the dredging operations are working more satisfactorily than when they began.

Q.—The estimate of the Chief Engineer is about 1,000 lakhs now?

A.—Yes.

Q.—Was it ever brought to your notice that there was an alternative method of completing the reclamation, by dry filling?

A.—No, I do not think so.

Q.—Recent investigations have shown that for about 5 crores you could have completed the work by dry filling?

A.—I do not know that, but I know that the dredging scheme was preferred to the dry filling, because of various reasons : one of them being that in the dry filling it would have been necessary to run a very large number of trains every day, to bring in the material, which it was considered, I think, the B.B.C.I. would not have been able to do.

Q.—There is no correspondence on that subject?

A.—No, but that is what I know from discussions I had at one time.

Sir M. Visvesvaraya.—Our personal inquiries from the agents of the Companies shows that they were willing to give facilities.

Sir Frederick Hopkinson.—That is for the future and not the past?

A.—That is for the future. At that time it would have taxed all their resources to run all the trains necessary. Further, it is not merely their capacity to run trains. It would have dislocated the whole foreshore there, causing great public inconvenience. Even with the restricted operations in the dredging scheme all the playing grounds, all the gymkhanas that you have on the main line front were affected—part of them had to be cut down, even with these dredging operations. If the numerous trains necessary for dry filling had to be run, many more lines would have had to be laid

on the sea-shore, and thereby great public inconvenience would have been caused. I believe that was one of the reasons why the alternative method of dredging was adopted.

Q.—We do not see any record to that effect in the papers?

A.—No.

Chairman.—It was not considered. It was a dredging proposition, and that is how they dealt with it.

Sir M. Visvesvaraya.—You are in favour of completing the scheme as soon as possible?

A.—As soon as possible.

Q.—As soon as circumstances permit?

A.—Yes.

Q.—You are aware that the Kay Committee in Bombay have recommended that the completion of the scheme was not a practical financial proposition, at least for the present?

A.—But that all depends upon how you look at it. True it is not a financial proposition for the present in the sense that if you produce all the land now you cannot sell it, and cannot get rid of it under present circumstances; but that is quite different from taking a larger view of it, which is that looking to what has been done it is desirable to finish the whole thing and to wait for better times, which waiting the Government of Bombay can afford.

Q.—But will not the interest charges mount up in the meantime?

A.—I take all that into account.

Q.—Have you made any calculation?

A.—No, I have not made any calculation, but taking all that, what do you estimate would be the cost of production per square yard—taking it at the most?

Q.—Have you made any calculation?

A.—No, I have not; but I take it that it might work out to 70 to 100 rupees per square yard.

Q.—Do you know that the critics in the report of the Advisory Committee say that they have made a calculation on which they find it would be very high, and would be prohibitive?

A.—What do you mean by "prohibitive"? That is what I want to get at if I can. Have they given any figures? If they say the land would cost 70 to 100 rupees per square yard, shall I say hypothetically, then I consider it a sound business proposition. You are sure to get 70 to 100 rupees for it.

Q.—What will happen if you throw open a large area of land is that prices will go down. A few people may take it at 100 or 120 rupees, but there will not be many to purchase large areas, and the rates generally will go down?

A.—To my mind that area will be snapped up at those rates when times improve.

Q.—You are aware that there are difficulties about the Ballard estate. There is land unoccupied there?

A.—There the trouble is this. The price at which the Ballard estate land was given was something like 800 rupees a square yard. Well, I am here putting down 100 rupees for this. At 800 certainly the Ballard estate land would not pay anyone. It was a mistake for the people to have taken it at those fancy prices.

Q.—At that time those people thought it would pay them?

A.—At that time, I agree. But I am not basing my expectation on this fancy value of 700 or 800 rupees. I would be content if you get 100 rupees a square yard, which I think you ought to do at any time.

Q.—There are lands there like the area vacated by the Cotton Trust, which are available, which cannot be sold?

A.—I do not know about that. But look to the military lands, bungalows and estates on Queen's Road which are to be sold, they had an offer for the whole lot at 100 rupees a square yard.

Q.—How long ago was that?

A.—That was last year; and they refused it as being much too little. Surely, then, this land, when the proper time comes, can fetch 100 rupees easily.

Mr. Billimoria.—But the cost would be 200 rupees. We have got an official document prepared by the Sub-Committee which was appointed to report on this matter, which says that.

A.—That may be so. I have not seen it.

Q.—The Report was published the beginning of this year—on the 21st January, 1926.

A.—I have not seen that; but if it is going to cost you 200 rupees, I quite agree there will be a financial loss.

Sir M. Visvesvaraya.—At any rate, a committee of business men have stated that the completion of the scheme was not a practical financial proposition. You seem to think the contrary.

A.—No, I will not say that confidently, if an expert Committee has gone into details and calculated figures, which I have not done. I am not prepared to put my opinion against people who have gone into the thing thoroughly, which I have not done.

Q.—Your general impression is that it is possible to complete it?

A.—As I have said—I put it hypothetically—if you complete this, and if it is going to cost, say, 70 to 100 rupees per square yard, then you will recoup all your money; if it is going to cost more, then it will be a different proposition.

Q.—We want the truth about these matters. We want to get to the root of the matter.

A.—I entirely agree. That is for you; but I am only putting before you what I know and think.

Q.—What do you think are the causes of the partial failure of the scheme, as you now know?

A.—The whole trouble is about the dredging, I understand—that it does not do the quantity, and you do not find the quality of material which it was anticipated would be there.

Q.—The prospects are very poor now, because land values have gone down. That is another point?

A.—Yes. I have given the reason why the values have gone down now. That is no doubt one of the reasons for the difficulty; and I have already pointed out the reason why the agitation against the scheme is so intense.

Q.—I ask you whether the scheme was considered approximate or final. When this scheme was submitted to the Government of India, was any statement of financial results prepared for the project?

A.—I cannot say. I was not there at the time.

Q.—Did you notice whether the scheme was accompanied by a statement of financial results?

A.—I cannot say.

Q.—When you prepared your scheme for 702 lakhs, what did you do? Did you not prepare a statement of financial results?

A.—At that time Lewis prepared the estimates, and the whole thing was gone into. It was published in a press note by Government, and it was put before the Legislative Council.

Q.—Was any Government communiqué issued on the subject?

A.—A communiqué was issued stating the revised estimates.

Q.—Was any Government resolution issued sanctioning the project? We have not seen any?

A.—I cannot tell you that. That must have been before January, 1921.

Sir M. Visvesvaraya.—I should like to know if Mr. Ewbank has seen any Government resolution sanctioning the project.

Secretary.—No, there is no Government resolution. It was sanctioned by the Secretary of State in Council in that telegram of which we have a copy.

Sir M. Visvesvaraya.—Was not that issued by the Bombay Government in the form of a Government resolution—as they usually do?

Secretary.—I could not say. We have not seen it.

Witness.—That was before my time, and I cannot say anything about it. Are you referring to the 702 lakhs estimate?

Chairman.—The 702 lakh estimate was in your time?

A.—I do not know whether there was a formal resolution, but I remember that a press communiqué was issued by Government officially stating the altered estimates, and so on; and they were put before the Legislative Council.

Sir M. Visvesvaraya.—It is usual, is it not, in the case of an important project like this, to issue a Government order or Government resolution?

A.—I do not see what difference it makes, if you issue an official communiqué and place the matter before the Legislative Council.

Q.—I am only asking what the practice of Government is.

A.—I am unable to speak about the practice. Sometimes it is done in one way and sometimes it is done in another.

Q.—Within your recollection no financial forecast was issued with the sanction?

A.—That is more than I can say. I do not know.

Q.—In other words, you did not take into account whether the project would pay, or to what extent it would pay?

A.—I cannot say that.

Q.—While general statements were made in the Legislative Council, and to the public, in the actual working out of the project and in the issuing of orders you did not say what results would be produced, as it is usual to do?

A.—I do not remember what was stated in the papers. The four crore estimate was going to cost Rs.10.15 per square yard. The revised seven crore estimate in all was going to cost about Rs.18. So it was obvious that if land could be produced at Rs.18 per square yard in that vicinity the financial results would be good.

Q.—It depends on the time you had to sell.

A.—But all that was taken into account. The Rs.18 was calculated taking into account the interest and sinking fund for a particular number of years—the anticipated period of sale.

Q.—Unfortunately we have not come across any calculations of that character by Government.

A.—I think they were made. A particular number of years was taken as the period which it would take to sell the land, and so on. I do not know exactly what number of years was taken.

Q.—Was that treated as confidential, or was it issued?

A.—I do not think there was anything confidential about it at all. It was merely a matter of arithmetical calculation.

Mr. Billimoria.—The period assumed was too small. The anticipation was that the whole of this area would be taken up immediately.

A.—I do not think it was anticipated that it would be taken up immediately. I am only speaking from memory; I may be quite wrong. It was seven or eight years. I think that was the calculation.

Q.—Experts have told us that it will take 50 years to dispose of the whole thing?

A.—Those who say that may be equally wrong. Seven years may be too optimistic, but 50 years is too pessimistic.

Sir M. Visvesvaraya.—Another boom may come after five or six years?

A.—Yes.

Q.—No definite forecasts were prepared and placed either before the Government of India or the Legislative Council?

A.—Forecasts of what?

Q.—Whenever a project for a railway or for an irrigation scheme is sanctioned, it is usual to submit a forecast of what the financial results are likely to be at the end of a definite period. That was not done in this case.

A.—It may not have been, but it was obvious, as I say. It was stated in those papers the cost at which you would be producing the land, and it was obvious then to anyone who knew Bombay what the financial result would be. Though the forecasts may not have been put in in actual terms, it was very simple. If you had, as you did have, put in there the cost at which land per square yard could be produced, it was obvious to anyone who knew the conditions in Bombay what the financial result would be.

Q.—But business men now say that that result is not likely to be satisfactory?

A.—They say that now, but they said the contrary at this time.

Q.—Which of them said the contrary?

A.—All these people who are now crying out against the scheme. They themselves went in for land at very high value. They themselves thought that land was going up. Why did they buy at what I now consider to be ruinous prices? Those are the very people who are now crying out against the scheme.

Q.—When it was found that the land values came down very considerably, did Government take any steps to change their policy either by restricting expenditure or by curtailing the scheme?

A.—I cannot say that, because that time never arrived when I was there. I left in June, 1923, and all this arose after that.

Q.—In your time the trouble had not become accentuated?

A.—No.

Q.—One point about the constitutional position which was referred to in the previous discussion. You stated that this was not a transferred subject and therefore it was not taken before the Legislative Council before it was sanctioned. It was not discussed or explained in the Legislative Council?

A.—The scheme was sanctioned by the Secretary of State before the new Constitution came into operation.

Q.—That was the original scheme of 400 lakhs?

A.—Yes.

Q.—Then you changed it to 702 lakhs?

A.—Yes. It was put before the Legislative Council, and they sanctioned the Budget on that footing.

Q.—The sanctioning of the Budget is one thing, and the passing of the scheme is another. At Budget time so many things come up that you cannot take it that the sanctioning of the Budget meant also sanctioning of the scheme.

A.—But the scheme had been sanctioned already by the Secretary of State before the Constitution came in. Then the costs got increased on the estimates, and the money was voted by the Legislative Council on the increased estimates.

Q.—You did not think it necessary to place the 702 lakh estimate before the Legislative Assembly?

A.—It was placed before them.

Chairman: And they voted on it, and passed it?

A.—In 1922-23 that was so. They were told " It is now going to cost this much, out of which we want to spend so much this year. Will you give us the money," and they gave it.

Sir M. Visvesvaraya: The cost was practically doubled?

A.—It might be anything, but whatever it was, all the figures and estimates were placed before the Legislative Council, and they were told " This scheme is going to cost seven crores. We want this year so much out of that; will you give it to us," and they gave it.

Chairman: It was put forward publicly in the Legislative Council. Sir George Lloyd had made a public speech about it, and the Legislative Council passed the grant?

A.—Yes. In moving the grant I told them what the new estimates were, and what the situation was. I made a full statement, and I asked for the grant for that year out of that amount, and it was sanctioned.

Sir M. Visvesvaraya.—At the time of the Budget there were a large number of allotments and sanctions?

A.—What does that matter? The Legislative Council knows its responsibility in passing grants for any particular department. It was up to them, if they had any doubts about it, to make futher inquiries or even to refuse the grant.

Mr. Billimoria: Some of the witnesses who have been before us have stated that no opportunity was given to them to discuss this important matter on the floor of the House.

A.—Who prevented them from doing it?

Q.—They say that even if they were given the opportunity, only five minutes was allotted to the matter in which they could not adequately discuss such an important question?

A.—If, as they say now, they got no sufficient time, it was entirely their own fault. The system is the same as here and as in all Legislatures. A particular number of days are allotted for the Budget. It is up to the Legislative Council and to the moving members there to concentrate their attention on what they consider to be important items, and to discuss those. If they choose to fritter away their time, as they did, on small unimportant items, spending days on small items of 500 rupees here and Rs. 2,000 there, and then the remaining grants are guillotined at the expiry of the allotted time, it is not the fault of Government.

Sir M. Visvesvaraya: We have been informed of that by Sir Maurice Hayward.

A.—Further, if I remember aright, I did tell them from my seat in the House that time was being wasted on unimportant matters and that the House had still the important grant of the Development Department to deal with, and I asked them to concentrate on that.

Chairman: That statement of yours is in our papers. We have got your actual statement in which you warned them that they were taking up time on unimportant items and that there were these other big items for consideration.

A.—What is the use of their complaining that time was not given to them? If they did not get time, it was their own fault.

Mr. Billimoria.—It is also suggested that honourable members did not know that the figure of 702 lakhs was an enhanced figure from 367 lakhs. It has been suggested that they were never told that the original estimate was 367 lakhs?

A.—They were told all that, both in 1921 and 1922. They were told the original estimated cost was 10 rupees, and they were told that the revised estimate was 7 crores, working out the cost per square yard at 18 or 20 rupees, whatever it was. There was no ambiguity about it at all.

Q.—They have complained about it. I am simply drawing your attention to their statements.

A.—I cannot help that.

Sir M. Visvesvaraya.—If Government want to sanction a project, do they discuss it before the Legislative Council, or do they sanction it themselves nowadays? What is the procedure?

A.—It depends upon whether it belongs to the reserved side or to the transferred side.

Q.—If it is the reserved side?

A.—If it belongs to the reserved side, then I believe Government sanction the project, but the Legislative Council have always a hold on it in this way: they have to sanction the grant of the money. They can refuse to do that if they are not satisfied with the scheme. For instance, take the Sukkur Barrage Irrigation Scheme. That was a reserve department in my charge, but nevertheless we had to go to the Legislative Council for a resolution of the Legislative Council approving of the scheme before we could go to them for a grant.

Q.—If an estimate is doubled, is it not necessary to get a fresh sanction from the Legislative Council? You could not send it up to the Secretary of State, because he has surrendered his authority?

A.—What more could we do? We told them the estimates were exceeded. We explained it to them, and we put before them Lewis's revised estimate.

Q.—At Budget time?

A.—Before Budget time. A communiqué was issued which placed them in possession of all these facts. Therefore they came prepared with the facts. Then they were told in the Council itself what had happened, and the grant was asked for on that footing, which they chose to sanction. What more could we do?

Q.—Just as you did in the Sukkur Barrage scheme?

A.—With regard to the Sukkur Barrage scheme, the project had not been sanctioned before the new Constitution came in. Sanction by the Secretary of State was given afterwards, and then we had to go to the Legislature with a resolution for approval of the scheme. In the other case, the Back Bay project had been sanctioned already before the Constitution came in, so there was no need of any formal resolution by the Council.

Q.—When the costs are doubled, it is practically a new project, is it not?

A.—You may choose to call it so, but we kept nothing back from the Legislative Council. We placed all our cards on the table. We told them exactly what had happened, and we asked for a grant. You may say, if you choose to do so technically, that there was no resolution passed. There was no difference in substance.

Sir M. Visvesvaraya.—This scheme had been turned down several times by the Government of India until 1917, had it not?

Chairman.—Not this scheme.

Sir M. Visvesvaraya.—The proposals for the reclamation had been turned down two or three times before?

A.—Yes.

Q.—And it was in 1919 that it was seriously taken up and an endeavour made to put the work in hand?

A.—Yes.

Q.—This was at a time of boom and prosperity. What the public complain of is that the Government acted at a boom time without calculating the cost.

A.—That is quite wrong. The cost was calculated. You may say that the Government erred with everybody else in Bombay in their anticipations.

Q.—That is what I wanted.

A.—They erred in thinking that land would be absorbed in a particular time and at particular rates but, as I pointed out, the very financiers who are now raising a cry—some of them, anyhow—were themselves the persons who offered to take over the scheme, or asked to be allowed to work the scheme as a private venture, because they then anticipated that they would make large profits out of it.

Q.—You say, "This comprehensive scheme was examined and approved by the Government of India and the Secretary of State, who must share with the Government of Bombay the responsibility for the same." They may share the responsibility for the 400 lakh scheme, but not for a 702 lakh scheme or a 1,000 lakh scheme?

A.—Oh, yes, because they were cognisant of what was happening. If they had thought otherwise they ought to have pulled up the Government of Bombay and said "No"; they could have done it. They had the legal power to do it. All the Legislative Council proceedings were formally sent to the Government of India and to the Secretary of State in the usual course.

Q.—Have not things gone wrong on account of the action of the local Government?

A.—In what manner?

Q.—If the work had been carried out within 400 lakhs, it would have been all right, but it will now go up to 1,000 lakhs, chiefly due to the action of the local Government?

A.—How?

Q.—It is they who took action about the dredgers, and it is they who took action in all matters concerning the scheme?

A.—I do not follow you when you say that you attribute that to the action of the Bombay Government.

Q.—Action or lack of action.

A.—What was the lack of action? They took what they considered to be the best expert advice. They acted on it. They got this scheme examined in such manner as was available to them, and they carried it out. What action or inaction of theirs accounts for the failure, if it is a failure?

Q.—Do you or do you not think that the failure of the scheme is due to the action of the Bombay Government?

A.—I do not understand the question. What do you mean by the action of Government?

Q.—The work was executed under the orders of the Bombay Government?

A.—Yes.

Q.—And it is the Bombay Government who is responsible for the good or bad results of the work. If the thing had gone on well, they would have claimed the credit. If things go wrong, they are to take some portion of the blame. Is not that so?

A.—Nobody wants to disclaim any responsibility at the results not having come up to expectations, but that is quite different from saying that they are to blame for the results. If they took every precaution which it was open to them to take, and if they consulted such experts as were made available to them, and if they then acted, surely you cannot hold them blameworthy if, by some mishap beyond their control, and beyond even the conception of all the people who are now complaining, things have gone wrong.

Q.—Things have gone wrong; you have to admit that?

A.—That is true. Many things go wrong in this world, but that is quite different from saying you are to blame for it.

Q.—Nobody is to blame, you think?

A.—I think so.

Q.—It is not right to treat the reclamation merely as a commercial speculation. Was that so understood when the scheme was originally sanctioned?

A.—Absolutely. The scheme, as I say, was sanctioned as part of a comprehensive scheme for the development and sanitation of Bombay. It was undertaken on that ground absolutely irrespective of its financial results as they were anticipated at the time.

Q.—Since the financial prospects appeared so unfavourable why did not the Government review the position and restrict the works and expenditure?

A.—By whom?

Q.—By the Bombay Government. When the Secretary of State sanctioned it, he sanctioned it because the Government of Bombay said the financial prospects were very favourable?

A.—No. On the contrary, as I have said, the Secretary of State was all the time pressing the Government of Bombay to tackle the housing problem on sanitary grounds. It is quite wrong to suggest that anybody was induced to enter into this scheme because of the brilliant financial results which were put before him.

Mr. Billimoria.—Was not the financial question a matter of consideration by the Secretary of State?

A.—Of course, but to say that he was led to sanction the scheme because of the financial prospects of it (which would mean that it was undertaken as a commercial venture) is not true.

Q.—Had the figures been otherwise, do you suggest that the Government of India and the Secretary of State would have given their approval to the scheme?

A.—I am not prepared to answer that hypothetical question. I do not know what would have happened.

Q.—Because throughout the correspondence we find the basis has been 367 lakhs?

A.—That is true.

Q.—That is the basis on which they were induced to sanction the scheme?

A.—True. If they had been told 7 crores they might not have sanctioned it, or they might have. I do not know.

Sir M. Visvesvaraya.—I am not criticising, but I want to know what you have to say to the oft-made complaint that you have over-stated the profitable character of the undertaking?

A.—When you say "you," whom do you mean—myself or the Government of Bombay?

Q.—Yourself.

A.—I have explained that there is no mistake about my figures. I have stated how I arrived at the figures, which I gave to the Council. I cannot do anything more.

Q.—Will you look at the top of page 4 of *this* report, where there is a quotation from your speech as follows :—

> "On the 28th February, 1921, Sir Chimanlal Setalvad promised that :—
>
> "I can assure the Council that when I come to move for the necessary grants for this Department, I propose to make a full statement to the Council as to the various items in this project . . . . . Taking the estimated expenditure on it, the cost per square yard works out to about 10.15. Now, taking the present valuation of land in the city, on a very modest estimate the result of the reclamation would be a profit of at least 30 crores of rupees to the city. It may be more, in all probability it will be more, and in certain circumstances it may even go to 50 crores."

Have you any explanation to give about that figure? Do you still adhere to it?

A.—I do not know what you mean by asking me if I still adhere to that figure. I certainly cannot say that will be the figure now on the present state of things. I tell you *here* exactly how I gave those figures at that time.

Q.—You do not think any modification is necessary in those figures?

A.—I do not follow the question. What do you mean by modification?

Q.—You have stated these figures here. Do you still adhere to the 50 crores?

A.—That is a very ambiguous question. If it means whether I still think this will be the profit, no; but if it means whether when I made the statement to the Council I had sufficient grounds and materials for saying so, yes.

Q.—You believed then that it would give a profit of 50 crores?

A.—I would not have made the statement if I had not believed it.

Sir M. Visvesvaraya.—Now perhaps you are inclined to change your opinion?

Chairman.—He has said so definitely, if you read the statement. His present view is "I anticipate that Government will get back all the money spent on it."

Sir M. Visvesvaraya.—You adhere to that?

Chairman.—Let me try to make plain a very simple point. In February, 1921, you, on figures given to you by Sir George Curtis, made an estimate of what you thought would be the probable profit to the Presidency if the reclamation scheme went through successfully. Those figures have now turned out to be entirely illusory, and your present view is clearly expressed, towards the middle of page 2 of your statement where you say that you anticipate that in 15, 20 or 25 years the Government will get back all the money spent on it. At present you think that Government may just come out about level?

A.—That is so.

Sir M. Visvesvaraya.—In another place you have stated "Rao Bahadur Chitale will remember that 30 or 40 crores of rupees, the profit which will be realised out of the land that will be reclaimed, will be available for ameliorating the condition of the poorer classes."

A.—That is the same point.

Q.—I do not criticise it. I put the point before you because many people have criticised it before us in Bombay.

A.—I cannot help that. If you tell me what the criticism is I will answer it.

Q.—I wanted your confirmation or your explanation on that point.

A.—It is there. I cannot add to what I have said.

Q.—Can you tell us what progress reports and statements you were receiving monthly, or at periodical intervals from the Department?

A.—I cannot remember that, but the usual returns were being made.

Q.—Did they place before you records of how the work was progressing, what the revenue prospects were, and what were the prospects of income from time to time?

A.—The progress reports were seen by me.

Q.—You may think differently from me, but I just want your opinion. The work was deprived of the technical and account checks of the Public Works Department. Would it not have been safer to have left the work under the control of the Public Works Department, which was an established department, instead of starting a new department?

A.—I do not think so. Here was work to which the Public Works Department was entirely new. It had never had experience of this sort of work at all. Further, when you say that the work was deprived of the ordinary checks of the P.W.D., that is not quite correct, because other checks of a more effective character were devised for the purpose. The Government of India made that one of their conditions of sanction. There was created an audit and account establishment under the orders of the Government of India, not subordinate to the Government of Bombay. They were there from day to day examining matters, and they had what is called a pre-audit system. Therefore, a proper scheme of control financially was devised, which was none the less effective, compared with the ordinary check of the P.W.D.

Q.—And technical checks?

A.—As I say, the P.W.D., with great deference, were not competent to exercise those technical checks, not knowing anything about the project.

Q.—Do you contend that the officers appointed had experience of reclamation work before they went there?

A.—You had engineers in charge who were experts, or who were supposed to be experts, in the matter.

Q.—In large schemes, even if the P.W.D. takes them up, it is usual to have consulting engineers. With the help of technical advice, could not they have carried out the work?

A.—I doubt that. Messrs. Meik and Buchanan were not consulting engineers. They were engineers in charge.

Q.—That is a doubtful point. They were five thousand miles away?

A.—It may be so. The chief engineer in charge of that part of it was to be appointed by them. Sir George Buchanan was to be a certain number of months in Bombay in the cold season, under the contract. They were the responsible engineers in charge.

Sir Frederick Hopkinson: They defined themselves as the actual responsible engineers.

Chairman: And the contract describes them as the undertakers of the work.

Witness: That was the footing on which the Government of Bombay acted.

Chairman: They were the people who had undertaken to carry out the work?

A.—Yes.

Sir M. Visvesvaraya: The Sukkur Barrage scheme was carried out by the P.W.D.?

A.—Yes, because it was quite a different thing from this.

Q.—How and why was it quite different?

A.—The Sukkur Barrage is not a novel project. The P.W.D. is quite competent to put up dams, but even there we had to create practically a separate department for it.

Q.—It was done under the chief engineer of the P.W.D.?

A.—Not the chief engineer in Sindh, no. There was a separate chief engineer created for the project.

Q.—But the Secretariat is the same?

A.—So here the Secretariat is the same.

Q.—No.

A.—Not the P.W.D.

Q.—A separate Secretariat was created?

A.—I hold there is no comparison between the Sukkur Barrage work and this scheme at all. This was work of quite a different character.

Q.—You are aware that technical work like sanitary engineering is also done by the P.W.D.?

A.—Those are matters on which I am not competent to express an opinion.

Q.—You are not competent to give any opinion on that point?

A.—I hold this view anyhow: it was no disadvantage (I will put it at its lowest) in this instance not to entrust this work to the P.W.D.

Q.—Who was the technical man on behalf of Government who took even a general survey of things—who examined the question on behalf of Government?

A.—There was a Director.

Q.—We have not seen one single large minute prepared by the Director, and when we asked him he said it was the business of the consulting engineers?

A.—You have to settle the matter between the Director and Sir George Buchanan, but the Director was there and he was responsible to Government for the working of it.

Q.—What Government seem to have done is to have appointed certain people temporarily and to have handed over the expenditure and the technical supervision to

those people and kept themselves free. Is not that the position in which you landed yourselves?

A.—I do not know what you mean by "handing over." Government created a special department, and appointed a Director of that department—a responsible officer drawing Rs. 6,000 a month.

Q. He was not solely on this work. He was in charge of several works?

A.—This was a part of the whole comprehensive scheme, and the Director was there to look after the whole thing.

Q.—Which technical officer checked these things and controlled the work of the department? There was the consulting engineer and there were his officers, but they were all outsiders temporarily employed, and you handed over all the responsibility to them in this case?

A.—It is no use further discussing this, because I am not responsible in any manner for the creation of that system. Perhaps you do not approve of it, but it is a matter of opinion after all.

Q.—You cannot give a very definite opinion?

A.—I hold such opinion as I have. It may be wrong or right. I think, as I say, putting it at the lowest, not making it part of the P.W.D. did not work to any disadvantage.

Q.—When any large work of this kind has to be carried out, consulting engineers are consulted by the department concerned, and the department carries out all the ordinary operations. The engineering work is not beyond the capacity of an ordinary engineer. All the engineering work which constitutes reclamation work can be done by engineers with general engineering knowledge, provided they have expert advice?

A.—What do you wish to ask me about?

Q.—I want to make it clear to you that as regards the operations of the P.W.D., that the P.W.D. could have done it?

A.—You know better than I do, because you belonged at one time to the P.W.D. I cannot do more than express the opinion which I have expressed.

Sir Frederick Hopkinson.—You have told us that you had definite details for the statement that the profit expected was to be 30 crores. Sir Henry Lawrence who was here last week said you had made a mistake in that—that you had put a nought too many in it. I think he said that he pulled your coat tails to correct you but that you refused to be corrected.

A.—Not to my knowledge.

Q.—Therefore it would appear from your statement that Sir Henry Lawrence was under a misapprehension?

A.—Yes.

Mr. Billimoria.—With regard to these figures and to your statement, that would be quite all right; but may I point out that the basis is not correct as far as these figures go. You say that 1,100 acres was the area of land to be reclaimed, out of which 400 acres was to be absorbed in roads and open spaces, leaving a balance of 700 acres available for building site. According to official documents we have 454 acres available for building site, meaning approximately 22 lakhs of square yards of land?

A.—That is because the plan was to put some public buildings there.

Q.—No, excluding all that. This is a total area. May I hand you this document? (*Document handed to witness*).

A.—They exclude the area for the military. If you include that it makes 700. It is the same point as the Chairman put to me.

Q.—If you take 22 lakhs of square yards instead of 35 lakhs, it will make all the difference in the figures.

A.—It will. If you make it still less it would make a greater difference.

Q.—You also based this estimate on the assumption that the land would be disposed of as soon as produced?

A.—No.

Q.—That was your remarks?

A.—I do not think that is quite accurate, because the cost of 10·15 included therein the interest and sinking fund for a particular number of years, which was the expectation —seven years I think—when the land could be sold.

Q.—You anticipated at that time that the whole area could be disposed of within seven years?

A.—Seven to ten years, if I remember rightly. That was the estimate at the time.

Q.—In your statement you have said that land was sold in the vicinity at 1,000 rupees, and in one or two instances at 1,200 or 1,400 rupees. Those, however, were

peculiar circumstances, were they not? As a rule land was not sold at that fabulous price. Subsequent sales have been at much lower figures?

A.—Land was sold in those days at 700 or 800 rupees.

Q.—You know that business people like to be within a certain area in close proximity to the banks and to the business houses. Therefore prices in the business area are higher for residential quarters. You could not, therefore have expected a very fabulous price in the reclaimed area, which was intended more for residential purposes than for business houses?

A.—You forget that, taking the residential quarter of Malabar Hill, in those days land was sold at considerably over 100 rupees a square yard, and in some parts of that area for 200 rupees a square yard.

Q.—If 1,100 acres were thrown on the market prices would not have remained at that figure?

A.—People would have snapped up that 1,100 acres at 100 rupees per square yard. The Indian chiefs would have taken it if it had been offered to them at 200 rupees a square yard. They would take it even now at reasonable rates. There would have been no difficulty of disposing of residential plots on the reclamation at the value I estimated in 1921.

Q.—Based on the conditions then existing, you may have been justified; but did you expect that those conditions would continue?

A.—I quite agree that at present there is no demand, but it is wrong to say that the value of land has fallen below what I stated then. I quite agree there are no buyers. People through various reasons have money locked up and they cannot produce it, but nobody sells land at a lesser price now. In Hornby Road even now land is being sold at 500 rupees a square yard. Even at Malabar Hill people do not part with their land at lesser values, although there is no demand for it, because they think that intrinsically it is valuable, and will realise proper values when conditions improve.

Q.—But one factor which, as business men, the Government should have considered was that if a large area of land was thrown on the market it would have a depressing effect, and prices would fall.

A.—The whole object of the scheme was to produce land cheaper for the citizens of Bombay.

Q.—Then you could not have expected normal prices but much lower prices?

A.—But those are not normal prices which I have calculated. 100 rupees is nothing for land situated so favourably as the reclamation land would be.

Q.—You suggest that even though the whole area were thrown on the market, the market would not have been depressed and the value of land would have remained the same—about 100 rupees?

A.—Yes. In 1920, 1921 or 1922, if you had this land ready to be disposed of on the reclamation, it would have fetched more than the 100 rupees I anticipated.

Q.—Did you expect that the reclamation would have been completed by 1921 or 1922? It has been stated that it would have taken six years to complete.

A.—But it was not then anticipated that the demand for land would so suddenly subside as it has subsided. Nobody thought the demand for land was going so suddenly to drop in Bombay as it has.

Q.—I quite admit that if you had land ready and available at that time, you might have been in a position to have disposed of it at 100 rupees or more.

A.—I think I could have then sold it for 200 rupees.

Q.—But supposing it took six years to get the land ready and available on the market; conditions would be otherwise, would they not? That aspect of it was not thought of.

A.—It may be otherwise one way or another. The prices may go up or down. Therefore I took 100 rupees and not 200.

Q.—On Page 2 you refer to the unpopularity which Sir George Lloyd incurred during his administration with a certain section of people. May we know what that unpopularity is to which you refer?

A.—I do not think it is advisable to go into politics.

Q.—You have made that statement in your note?

A.—I have.

Q.—If you could clear it up it would be much better.

A.—I am not running away from it but it is not desirable to enter into any political controversy.

Q.—Do you wish to omit it from your statement?

A.—No, I do not want it to be omitted. With certain sections he had incurred unpopularity.

Q.—That is a sort of reflection upon the Governor?

A.—No, not at all. An administrator may make himself unpopular with certain people who want him to do things which it may not be right for him to do. There is no reflection at all. I have not put it as a reflection. I am stating it as a fact.

Chairman.—Every administrator in a great position is sure to be unpopular on some occasions with certain sections is he not?

A.—Every strong administrator is.

Mr. Billimoria.—You say that you would expect an average price of 70 rupees on the reclaimed area? Did you take an average of all the land, some in block 7 and some in block 6?

A.—Yes.

Q.—The Committee which sat in Bombay to consider the question said that even 20 rupees would not be realised for land in block 7. Therefore, on an average, it would not work out to your figure?

A.—I do not agree with them at all. They are much too pessimistic. It seems to me that everybody in Bombay now is too pessimistic, and that no proper view of things is being taken of this matter.

Q.—That was a representative committee, representing the Municipality, the Chamber of Commerce, and business interests?

A.—All these business men are affected by the prevailing conditions. I know what the erstwhile President of the Indian Merchants' Chamber thought at one time about land in Bombay, and what he thinks now.

Q.—With regard to the question of this military area, you now suggest that the Government of India may be approached with a request to give a higher value?

A.—I think that is a very fair request to make.

Q.—Supposing if this land had been reclaimed for 7 or 10 rupees, as was originally intended, would you have come forward and refunded some part of the money to the Government of India? Is it right that, having once entered into a contract, you should try to rescind that contract?

A.—This is not a contract between private parties. Here was the supreme Government who was responsible, as I say it was, for sanctioning the scheme. Soon after the scheme was sanctioned they said " We require for our purposes certain land out of this; you must give it to us, and at cost price; you must not make a profit as between the two Governments." The Government of Bombay acceded to that. Now if it is found that the actual cost to the Government of Bombay is going to be much more, I think it is reasonable to ask the other Government to reconsider the position.

Q.—You consider that equitable, do you?

A.—Quite. I think it would be inequitable to do otherwise.

Q.—Do you hope the Government of India will accede to that request if the Government of Bombay approach them?

A.—That is more for the Government of India to say than myself.

Q.—Then, in your statement, you suggest that a certain financier came forward and agreed to pay the Government a profit of 2 crores if the scheme was transferred to him. You have not mentioned any names. If you do not want to mention the name I do not want to press you, but, as the statement is made, people in Bombay may say——

A.—I am quite willing to mention the name if you so desire. There is no secret about it.

Q.—I think it would be very much better.

A.—Unfortunately the gentleman died only a few days ago—Sir Sassoon J. David.

Q.—In answer to a previous question, you said that if there was a slight variation from 367 to 400 lakhs, you would have no reason to go to the Government of India; but when the figures had practically doubled, did you place all the facts before the members of the Council?

A.—Yes, the fullest information was given.

Q.—With regard to the question of chawls, about which the Chairman asked you some questions, is it not true that the chawls were condemned by the working classes because they were not suitable?

A.—If anybody condemns them they are quite wrong. I have seen them and inspected them. I quite agree that improvements are possible in their construction but, as I said in the Legislative Council on one occasion, they are heaven compared with the hell in which the people are living now.

Q.—The mill hands call them dungeons?

A.—They may say so, because various interests put them up to say so. You go and see them, as I did while the work was in progress and while they were being

tenanted. I maintain very strongly that they are much more sanitary. There are much better amenities there—open land, dispensaries, hospitals and playing grounds for the children. As I say, it is heaven compared with the conditions in which they are living now.

Q.—The Government depended entirely upon expert advice before launching on this scheme, and that was Sir George Buchanan's advice. The Government had no technical knowledge of it. They had to rely upon their experts, and they did so rely?

A.—That would be so, under the circumstances in any scheme of this character.

Q.—If things have gone wrong, therefore, it is not the Government who are to blame, because they had to depend upon whatever expert advice was available to them at the time?

A.—I should think so, but I am not here to apportion the blame between the Government and the engineers.

Chairman.—There is only one other matter to which I ought to have called your attention. In your written statement, at about the tenth line on page 1, you say "I resigned office on the 16th June, 1923. The dredger 'Sir George Lloyd' had then just arrived." The dredger in fact arrived on the 31st March, 1922. Therefore your statement is inaccurate?

A.—My statement is inaccurate. That is my mistake, I quite agree. I can recall now how I made that mistake. The dredger arrived, no doubt, in 1922, but I inspected it a week before I left office. I confused that date with the date of its arrival.

(*The Witness withdrew.*)

(*Adjourned for a short time.*)

Mr. Robert Duncan Bell, C.I.E., I.C.S.
Called and Examined.

Chairman.—What are your Christian names?

A.—Robert Duncan.

Q.—Were you one of the Secretaries of the Development Directorate from the 5th July, 1924, to the 1st April, 1926?

A.—Yes.

Q.—Did you at any time act as Director?

A.—Yes.

Q.—That would be during the absence of Sir Lawless Hepper on leave?

A.—Yes.

Q.—Do you happen to recollect what time that was?

A.—The whole of April and half of May this year, 1926.

Q.—Was your appointment on the 5th July, 1924, your first association with the Development Directorate?

A.—Yes.

Q.—In what capacity had you been acting previously?

A.—Immediately before that I had been Director of Industries in Bombay.

Q.—You are a Member of the Indian Civil Service?

A.—Yes.

Q.—You had taken no part whatever in the Reclamation Scheme until the 5th July, 1924?

A.—That is correct.

Q.—By about that date the working of the Season 1923-24 had become known?

A.—It became known about that date; I cannot recollect exactly when.

Q.—The working season of 1923-24 gave disappointing results?

A.—Yes.

Q.—Similarly the working season of 1924-25?

A.—Yes.

Q.—1925-26 gave somewhat better results?

A.—Yes. I am not perfectly certain of the precise results in 1925-26.

Q.—But generally?

A.—Generally, yes.

Q.—What were your actual duties as one of the Secretaries? What was your daily work?

A.—Well, of course I had other duties besides those relating to the Reclamation Scheme.

Q.—Exactly?

A.—As Secretary to Government I was not at the outset very much concerned with the execution of the Scheme as an engineering scheme. The Director and Government consulted together mostly. At least that was so at the outset.

Q.—When you say "at the outset" you are speaking of July, 1924?

A.—Yes.

Q.—That is the outset so far as you are concerned?

A.—Yes, but I was specially concerned with such matters as ways and means—obtaining loans from the Government of India. The Director had not much direct concern with that. I was more especially concerned with the agreements with the staff. Once it was agreed that a man should be appointed the details of the agreement were left in my hands in the first instance. The legal position of Sir George Buchanan when he was unable to come to Bombay was largely in my hands—the papers were. Generally speaking, all matters which required the decision of Government came through my hands.

Q.—As regards ways and means, a loan was floated originally, was it not?

A.—Yes.

Q.—That was taken up quite eagerly by the people of Bombay and of the Presidency generally?

A.—I was not in Bombay at that time. I was away on leave.

Q.—Have you any information on that point?

A.—Just as much as any other man who had been home in that year.

Q.—How much is that?

A.—Certainly that it was well taken up.

Q.—In point of fact there has always been money to finance the expenditure right up to the time when you left?

A.—Yes.

Q.—The expenditure up to the time when you left would be in the neighbourhood of 5 crores?

A.—Yes.

Q.—That is £3,750,000. One at least of the reasons why the Reclamation Scheme was entered upon was the belief that the land could be sold readily at a profit?

A.—Yes.

Q.—Are you able to give us any information as to the view of the Department on that matter or your own personal view?

A.—You mean the view taken in the past?

Q.—Yes.

A.—When I became Secretary the financial procedure was largely based, so far as I can recollect, on this basis, that the whole of the development land might be sold in 11 years at an average rate of 40 to 60 rupees per square yard. That does not mean necessarily that it was contemplated that the land should be sold in 11 years at that rate. Sales might have been spread over a longer period and higher rates realised. That is what I mean by sales policy. There has been strong commercial opposition in Bombay to dumping this large area of land on the land market, but from the financial point of view, if you put the land on more slowly you might realise corresponding higher prices and in the long run obtain the same financial result.

Q.—But as a considered financial scheme was it thought that the land would on an average yield 40 to 60 rupees per square yard and be disposed of in a period of 11 years.

A.—That was the basis, according to my recollection, of the financial policy.

Q.—That would have shown a considerable profit?

A.—Yes.

Q.—Was that opinion maintained until you left in April, 1926, or was it subject to any modification?

A.—When I first became Secretary in July of 1924 Mr. Martin, who had been Secretary before me, was then acting as Director. He to some extent carried some of my responsibilities as I was new, and he and the Financial Adviser at that time gave Government an assurance that the Department's schemes as a whole were solvent. I cannot recollect any details now, or what figures they took for Back Bay; but very shortly afterwards in the following dredging season it became clear that the assumptions for Back Bay had to be abandoned.

Q.—As regards the engineering part of the scheme, you had nothing whatever to do with that?

A.—Not till I acted as Director.

Q.—And that was during the period April and May of this year?

A.—Yes.

Q.—That would be just towards the end of the dredging season?
A.—Yes.

Q.—The " Sir George Lloyd " would go into dock some time in May, I suppose?
A.—Yes.

Q.—How long have you been associated with Bombay?
A.—I was in Bombay for three years, 1909 to 1912, and I have been there since 1919. I have been there continuously since 1919, except for leave.

Q.—It was stated in the Report of the Development Committee of 1914 with regard to the housing conditions in Bombay that in 1911, out of a total population of 929,082 people, 743,247, about 80 per cent. of the population, lived in 166,337 one-room tenements. That was in 1911?
A.—Yes.

Q.—Even in 1911 that was rather a shocking state, was it not?
A.—Yes.

Q.—The conditions of overcrowding and conditions of life in Bombay then were not to the credit of a great city like Bombay?
A.—No.

Q.—Were the conditions in 1919 worse than that?
A.—They were much worse.

Q.—We have been told yesterday and again to-day that the population by 1919 probably went up from 929,000, spoken of in 1911, to 1,500,000?
A.—I should think that is too high.

Q.—You think it is a little high?
A.—I think so.

Q.—At what figure would you put it?
A.—I should not put it higher than 1,250,000.

Q.—Were the housing conditions of the working classes always a source of anxiety to the Government of Bombay?
A.—Yes.

Q.—And had they always a desire by some means or other to ameliorate them?
A.—Yes.

Q.—Was it mainly with that object that under the Development Directorate the Salsette, the building of chawls, and other activities were created?
A.—Yes.

Sir M. Visvesvaraya.—You were also called the Deputy Director?
A.—Yes.

Q.—Secretary to Government and Deputy Director of Development?
A.—Yes.

Q.—In what respects can you help us in this enquiry—I suppose in financial, technical, or administrative aspects?
A.—Yes.

Q.—Do you recollect whether, when the 702 lakhs estimate was sanctioned, a Government resolution was issued on the subject?
A.—I think that was before I joined.

Q.—But have you come across that resolution which is the basis of the whole work sanctioning the 702 lakhs? We have not seen any Government resolution on the subject.
A.—I cannot recollect it. I do not mean to suggest there is not one. I mean I may not have seen the actual orders.

Q.—Who is directing the operations? Is it the Development Director and the consulting engineer, and the chief engineer working under both those officers?
A.—For the Back Bay scheme, yes.

Q.—How were their mutual relations defined? In the course of the evidence given by him, Sir Lawless Hepper has stated that the responsibility for many of the technical operations was that of the consulting engineer.

Chairman: Who was the consulting engineer?
A.—Sir George Buchanan in my time, or his firm, was always regarded as the engineer in charge of the scheme and responsible for designs. The Director was responsible for seeing that there were no impediments to the progress of the work.

Sir M. Visvesvaraya: It was left to the consulting engineers.

Chairman: Who are the consulting engineers? I have not heard of them. I do not know them.

Sir M. Visvesvaraya: Messrs. Meik and Buchanan.

Chairman.—Do you accept it that Messrs. Meik & Buchanan were the consulting engineers?

A.—The Department always took the view that they were the engineers in charge of the scheme.

Sir M. Visvesvaraya: If you read the agreement I think it says " consultant."

A.—That is how the Department interpret the agreement.

Q.—As consulting engineers?

A.—No; engineers in charge.

Q.—I think in the agreement you will find the word " consultant " is used, and I want to know what was the actual understanding between them and the Government.

A.—There is a phrase, as far as I remember, in the agreement that they were to perform all duties which appertained to the engineers of charge of large works.

Chairman: They may be described as consulting engineers in the agreement, only I have not found it. When they were asked to make a report they were consulting engineers, but I think that is what you must mean. (*Agreement consulted.*)

Sir M. Visvesvaraya: Then my statement requires correction. You treated them as the engineers for the Government?

A.—Yes.

Q.—Apparently the Development Director did not give any instructions on technical matters without consulting the engineers?

A.—No.

Q.—If any estimate was exceeded, who sanctioned the excess?

A.—Any excess required the sanction of Government.

Q.—Was any estimate ever considered by the Development Department for completing the reclamation by dry-filling? Was that ever considered by the Development Department in your time, or have you come across it in the course of your study of the records?

A.—I can only speak of my time. There was some consideration given to the question when the Sub-committee of the Special Advisory Committee was constituted. You will find various tables attached to their report.

Q.—I suppose you could not tell me what the opinion of the Department was as to whether it was feasible or not?

A.—No definite conclusion was reached at the time.

Q.—Were the railway authorities ever consulted as to the facilities they would give if you wanted a large quantity of moorum?

A.—Yes.

Q.—What was their reply?

A.—At that time the maximum was six trains per day.

Q.—They promised that?

A.—Mr. Elgee, I think, conducted the negotiations direct. He could give you better information, but my recollection is that they could put in six trains per night.

Q.—He says they agreed up to four trains, and six might possibly have been done, but we understood they were able to give more than six trains.

A.—No; we clearly understood that they could not give more than six trains at that time.

Sir Frederick Hopkinson: It was for the future?

Sir M. Visvesvaraya. For the future they were able to give more than six.

A.—That may be so.

Q.—What reports did the Development Director submit to the Government, monthly or weekly, showing the progress of the work, the rate at which the operations were being carried on and the financial results as compared with the estimate? Were those discussed and reports made at intervals?

A.—I cannot speak before my time, but perhaps I ought to make it clear that one of the objects of organising the Directorate and appointing a Director who had a salary larger than any member of the Government except the Governor himself was, as I understood it, to relieve the Government of detailed examination of routine returns of that kind. There was a weekly report submitted by the chief engineer to Messrs. Meik & Buchanan of which a copy was supplied to the Director every week, and there was a detailed weekly report of the progress of dredging supplied to the Director every week, and as far as I can recollect, to Messrs. Meik & Buchanan. At least latterly, that report was sent to Government every week, but generally speaking, it was the business of the Director to inform the Government of any unusual departure from the programme.

Q.—Who generally made the appointments? Who recommended the appointments and who sanctioned them?

A.—All the appointments were made by Government. Some of them were made in the terms of this agreement on the nomination of Sir George Buchanan.

Q.—What was the system followed in ordering materials from England? Who made the first recommendation, who checked the indents, and who finally sanctioned them? What was the procedure followed? Did the matter ever come to the notice of the Secretary to Government and the Deputy Director?

A.—I have no clear recollection of any important material being ordered in my time, but the usual procedure is that it is ordered through the Director General of Stores.

Q.—All stores are ordered through the Director General of Stores?

A.—All stores are obtained through the Director General of Stores. Messrs. Meik & Buchanan may have taken a part in the purchase and probably did, but the Director General of Stores was responsible for the purchase, as far as I know, for the inspection and for shipments.

Q.—He is responsible for the rate and cost and for the quality of materials, but who was responsible for suggesting such-and-such materials are required and should be ordered, and then who sanctioned the quantities and transmitted them to the Director General?

A.—Sometimes a suggestion came, in the first instance, from the chief engineer, and sometimes, in the first instance, from Messrs. Meik & Buchanan; but I am only talking now from what I have read in the papers.

Q.—Who checked the quantities of materials ordered? In what branch of your office did they check the quantities ordered? Did you invite tenders through the Director General of Stores?

A.—The Director General of Stores would call for his own tenders and decide the matter on his own responsibility.

Q.—You did not ask to see the tenders?

A.—But they might in doubtful cases be referred by him to Bombay before acceptance—I think that is at his discretion—or he may be asked to do it in special cases.

Q.—Who took action about the Audit notes and the more important audit objections raised by the Accounts Department?

A.—I think all audit objections were ultimately disposed of under orders of Government.

Q.—By you as Secretary?

A.—The orders of Government were actually taken. I did not dispose of them personally, not on my authority.

Q.—Do not you think 90 per cent. are disposed of by the Secretary? Is not he the person who has the most authority in such matters?

A.—As a matter of fact we had very few Audit objections. We had a system of pre-audit. Anything which was objected to was probably sufficiently important to go up to Government.

Q.—The pre-audit is mechanical, but the actual Audit objections raised on the more important questions by the Accounts Department come to you on a separate basis. Finally they were dealt with by Government, you say?

A.—Yes.

Q.—Are all the objections properly dealt with and a Government resolution placed on record, or is an order passed and the papers recorded?

A.—Would you repeat the question?

Q.—Are all these objections considered by Government, and a Government resolution placed on record; or are they disposed of by an office note?

A.—No. Explanations are taken from the staff concerned, and they are considered.

Q.—What is the final shape in which the order issues?

A.—Usually a Government order.

Q.—A Government resolution?

A.—Or an order.

Q.—Who took notice of any great irregularities and suggested remedies? For instance, when the dredger failed to give the required output, who took action to remedy the defect if possible?

A.—The first important report in my time was Sir George Buchanan's in December, 1924, or January, 1925. That was brought to the attention of the Government at once and discussed by Government personally with Sir George Buchanan.

Q.—What action was taken on that report? Did you make any reference to the India Office, or to the Naval Architect, or did you make any reference to the builders of the dredger?

A.—So far as I recollect, not at that time.

Q.—Did you make it at any later stage?

A.—In the middle of 1925, when Sir George Buchanan was requested to come to Bombay with a representative of the makers, and also a representative of the Consulting Naval Architect.

Q.—But there is no description of the defects discussed, no order placed on record, and no report received? No report is on record, either from the firm or from Sir George Buchanan, of what was wrong and what remedies were necessary, and what steps should be taken by the Government. There is no conclusive action taken when the dredger failed to give the required output. I only want to know the facts. Can you tell us why that was so?

A.—That involves rather a long story.

Q.—When a machine is not working satisfactorily, the usual thing is to make a reference to the manufacturers and ask them why it is so, and what steps they would take to remedy what was wrong. If they are not legally bound to improve it, or to put it right, then they might be asked to say what additional charge they will make for putting it right. Was anything like that done? There has been some informal correspondence and nothing more, so far as I can see. Why is that?

A.—There were frequent personal consultations between the Government and Sir George Buchanan, and according to my recollection a representative of Messrs. Simons & Co., was once or twice in Bombay possibly even in the dredging season of 1924-25.

Q.—But there is no clear statement showing what the communications led to in any of the correspondence : why is that?

A.—I think all the written reports must be before the Committee. As to personal discussions I cannot tell you, I was not present.

Q.—The Government should have put pointed and definite questions to the engineers and builders, asking them why the dredger was not working satisfactorily and what remedies they had to suggest. But apparently such questions were not put and there are no direct replies on record.

A.—So far as I am aware, the working of the first season was not looked upon as conclusive of the dredger's efficiency.

Q.—How could it be conclusive when you allowed material to escape through the foundations of the sea-wall? It could not be conclusive. The proper thing was to take immediate steps to find out all the difficulties and to apply remedies, was it not?

A.—That may be so; but Sir George Buchanan did not think so, so far as I can gather.

Q.—As I can understand, the Development Director did not actually take part in the technical supervision of the works. He had something to do with it, but I have not seen any note by the Development Director at any time on any technical matter?

A.—He was not in any way responsible for the designs, for example.

Q.—Not even for examination of the designs submitted to him by the engineers?

A.—So far as I know, the only instance in which the Director may be said to have interfered with the course of operations laid down by Messrs. Meik & Buchanan was when the sea-wall was sealed.

Q.—That makes the matter clear. You have stated in your Back Bay Inquiry note that you are a little afraid the Government of India might not accept block 8 without the other blocks being completed. Is that what you mean?

A.—Not necessarily; but I should think they would expect block 8 to be put into such a condition as would fulfil the original intentions of the Government.

Q.—You want proper access to that block?

A.—It is not my business. It is the business of the Government of India. I only draw the attention of the Committee to the point.

Q.—What made you raise this question now?

A.—I had seen no evidence recorded on the point.

Q.—As far as I know, it is possible to find access to the site by a broad road. You are satisfied that you did not require the help of the Public Works Department in supervising this work?

A.—I have never said so.

Q.—It is said in some quarters that the Public Works Department should not have been superseded in the construction of this work, but it should have been under the supervision of the Public Works Department just as the Sukkur Barrage. What is your opinion on that point?

A.—I should not like to use the word " supersession." You cannot consider the organisation apart from the other schemes. The Public Works Department is organised in two branches. The Government might have organised the present Department on exactly the lines laid down, denoting it the Public Works Department Development

Branch; but it is only a name one way or the other. There is no material difference. As regards personnel, the personnel is another matter.

Q.—You have got engineers, and you have got several officers employed on reclamation. You must remember the relations of the Government to these officers, or the relations of these officers to the Government, are temporary, because they are temporary employees. Is it right to entrust them with all appointments, and with the ordering of material, without any technical scrutiny on the part of any permanent Government official, or on the part of any permanent Government Department? Was it safe to do this?

A.—I think so.

Q.—It was safe to entrust the ordering of materials and the appointment of engineers, without any scrutiny by any technical officer of Government?

A.—They were all officers of Government. The Public Works Department themselves have many temporary officers. All their specialist officers are temporary officers. Many of the staff on the Sukkur Barrage are temporary officers.

Q.—There is a distinction between temporary and permanent officers. The permanent officers have a stake in the Department?

A.—The first Chief Engineer was a permanent servant of the Government.

Q.—It was by accident more than anything else?

A.—So far as I am aware, Mr. Lewis was always a permanent servant on the cadre. He was on the permanent staff of the Government.

Q.—That may be; but there were the other officers. It is not that I am making any reflection on them, as no doubt they are very good men?

A.—In every scheme we had Superintendent Engineers who were permanent members of the Public Works Department cadre: Mr. Harvey and Mr. Browne.

Q.—How many of them?

A.—Those two—I think there are three.

Q.—What is the total number of engineering officers employed in the Department?

A.—I could not answer that offhand.

Q.—One of the witnesses said that there were 20 officers, of whom only one was an Indian. On that I am not particular; but why did not you take some European officers from the Public Works Department on to this reclamation work?

A.—I cannot say. That is before my time.

Sir M. Visvesvaraya: Thank you. You had made some points very clear.

Sir Frederick Hopkinson: In your note you throw doubt on the certainty that the Government of India will accept mere completion of Block 8 without means of access through Block 7?

A.—Yes.

Q.—I suppose when the Government of India agreed to take Block 8, it was understood that that was only a part of the full scheme?

A.—Yes.

Q.—And that if Block 8 alone were finished, the Government would be in a totally and entirely different position. They might say: " We have no access to this Block "?

A.—Yes.

Q.—" It is not what we agreed to take. We agreed to take Block 8, which is a portion of a larger scheme "?

A.—Yes.

Q.—Therefore you suggest that conceivably the Government might refuse to take Block 8?

A.—They might require the Government of Bombay to make some alternative provision.

Q.—At any rate the only access to Colaba is through the bottle neck past the Colaba Post Office?

A.—Yes.

Mr. Billimoria: In answer to the Chairman you said the reports for the years 1923-24 and 1924-25 working were not quite satisfactory—the output was not very satisfactory?

A.—Yes.

Q.—What was the nature of the information that could ever reach the public? What was the source? It would be the annual reports of the directorate, would it not—any information that the public could glean of how the works were going on would be the annual reports of the Development Department?

A.—And the debates in the Legislative Council.

Q.—Were all the facts disclosed in the annual reports of the Development Department?

A.—I could not answer that offhand without referring to the reports again.

Q.—You must be very familiar with these reports, as Secretary of the Department?

A.—That is quite true; but I am not prepared to say.

Sir M. Visvesvaraya: As Deputy Director you must have drafted them?

A.—No, I did not.

Chairman.—Sir Lawless Hepper said he drafted them and took the whole responsibility for them.

Mr. Billimoria: Will you take those reports. (*Same handed.*) If you will kindly look through these reports, there is no indication anywhere to the effect that the work is not satisfactory?

A.—I think that is so.

Q.—That is so, is it not?

A.—Certainly up to 1925.

Q.—The public were therefore absolutely kept in the dark and ignorant of the true state of affairs?

A.—I cannot agree entirely with that statement. I should explain that in September, 1924, a special Advisory Committee was constituted to examine and to report on all Directorate schemes, and I think that at the outset, at least, the Government hesitated to deliver any opinion which might appear to be a judgment previous to the judgment of this Committee. It might make matters clear if I say that my own opinion is that the prevalent opinion on this subject has arisen from the fact that this special Advisory Committee took such a very long time to issue their reports, but all the information was submitted to them at once.

Q.—Were all the facts placed before the Advisory Committee? Were they told about this?

A.—I did not attend their meetings. I have no reason to consider that any material fact was withheld from them.

Q.—We have on the record that certain Members of the Advisory Committee complain that facts were not placed before them—even the Bombay Chamber of Commerce were not informed?

A.—I only know of one case where the complaint was made. It was that of Mr. Manu Subedar on the finance Sub-Committee. I attended a good many meetings of that Sub-Committee and I was present when he made the request. I pointed out to the Director that he had no authority, without the previous sanction of Government, to disclose Government records, and I pointed out that in some cases the sanction of the Secretary of State might even be necessary to disclose correspondence with him. It was a matter of routine under Government Orders that they should be consulted beforehand before their records were disclosed. Very little time was lost in obtaining their Orders and so far as I am aware there was no hesitation in handing over the information to Mr. Subedar.

Q.—How long did it take?

A.—A week or 10 days I should think—10 days at the most.

Q.—From his letters he has made a very serious complaint that material information was kept back and until that letter was handed in he was not given an opportunity of going through anything?

A.—Mr. Subedar frequently asked for information which took a considerable time to compile, but the correspondence for which he asked at that time was produced within a week or 10 days.

Q.—Were the Advisory Committee informed that the dredgers were not working satisfactorily. Were they told by your Department?

A.—The results were discussed on the basis that they were unsatisfactory so far as I am aware.

Q.—You were the Secretary at the time the agreement with Sir George Buchanan was terminated?

A.—Yes.

Q.—Do you think that the Government were justified in terminating that. It was done on your recommendation, partly, was it not?

A.—This is a decision of Government. I cannot recollect now in what precise terms I gave them any advice, but I agree that they were justified in terminating it.

Chairman.—I am not sure how far that question is within the terms of our Reference.

Mr. Billimoria.—It is on the records.

Chairman.—I do not know how far the legal question whether the Government was justified in terminating the agreement, is within the terms of our Reference. We have had the papers but it does not follow that that brings it within the terms of our Reference. Anyhow it would be very unwise of us to express any opinion on that matter. We must not express any opinion on it in our report.

Mr. Billimoria.—The point might arise in this way. Suppose one party has to be blamed for certain things, then it may be the action of the Government was absolutely justified. It would come under that?

A.—May I make the point clear. I am not responsible for the legal advice to the Government in the matter.

Q.—In answer to a question of the Chairman you said that you contemplated the disposal of the whole of the land would take about 11 years at an average rate of 40 to 60 rupees a square yard. That was the basis of the scheme?

A.—That was the basis on which the Loans Programme was drawn up so far as I can recollect now, but I never actually had to work on that Programme. The circumstances entirely changed by the time I had to handle the matter.

Q.—So you are not in a position to say anything in that respect?

A.—Beyond the bare statement which I have already made.

Q.—Then you cannot say who was responsible for suggesting that?

A.—No.

Q.—That the whole area could be disposed of in 11 years?

A.—No.

Q.—The documents that are before us and the correspondence with the Government of India distinctly indicate that the Public Works Department in the past contemplated from about 40 to 50 years for the disposal of that area. Since you cannot express any opinion on that I will not trouble you about it. Then in answer to the Chairman you said something about overcrowding. A passage was read out to you suggesting that there was overcrowding in the City. What was that overcrowding of. Did it consist of the lower classes, the middle classes or the wealthy classes?

A.—All classes in 1919-20.

Q.—In what proportion?

A.—It is difficult to say. I think everybody was crushed in Bombay at that time.

Q.—Did you find many millionaires coming into Bombay or was it the working classes that were gathered together, who came out from the districts?

A.—Well, I can speak for my own community. They were living in very crowded circumstances at that time.

Q.—How many would they be—500, 1,000 or 2,000?

A.—I will give you an example. The premises of the College of Science had to be used for a time as a hostel in order to relieve the congestion.

Q.—What would be that number. How many people would that be compared to an increase of population from 800,000 to 1,200,000. What would be the proportion of those well-to-do classes to that increase?

A.—I would not like to make any estimate now.

Q.—It would hardly be any—is not that so—not more than 400 or 500 people?

A.—Of Europeans I think it might be more than 400 or 500.

Q.—How many more, roughly?

A.—Up to about 1,000 or 1,500 perhaps.

Q.—So you did not expect that this other 400,000 or 500,000 that had come into Bombay would go and occupy the reclaimed area on the sea front—you did not expect them to go and live there?

A.—I was not concerned with the scheme at that time, but so far as I know no one contemplated that those classes would live on the Reclamation.

Q.—For whom was the scheme? Was it for the poor classes or for the rich classes?

A.—I should say partly for office accommodation and partly for the housing of the middle classes, especially the upper middle classes.

Q.—When you talk of office accommodation, which portion of this reclaimed area would be occupied by offices? What do you contemplate?

A.—In the vicinity of Church Gate Street Station.

Q.—That is a small area. That is block No. 2?

A.—Yes.

Q.—That is a very small area compared to the vast scheme of reclamation. It is proportionately a small block.

A.—You have the exact figures.

Q.—Block No. 2 is, I think, the part you mean, and block No. 2 is about 500,000 square yards?

A.—Yes.

Sir M. Visvesvaraya: Four-and-a-half lakhs of square yards?

A.—Yes.

Mr. Billimoria. That would be the only area that you contemplated would be taken up by offices, and the rest would be a residential area?

A.—Yes. I do not know what was contemplated by the authorities at that time. I am giving you my personal opinion, looking back at things now.

Q.—You do not want to express any opinion on that? Then you were asked by Sir M. Visvesvaraya about the audit objections. Were there any serious objections from the audit department and from the Accountant-General?

A.—In my time I cannot recollect anything serious.

Q.—Were they all of a technical nature?

A.—Yes; as far as I am aware.

Q.—Did not the accounts officer point out that the cost of filling in the reclaimed area was far in excess of what was contemplated, taking depreciation and interest into account?

A.—When was that? I think that was after the state of affairs was well known to Government.

Q.—It was worked out that the total expenditure on the project, taking what it was going to cost per cubic yard, when compared with the estimates of Sir George Buchanan, was far in excess of what had been contemplated.

A.—Would you refer me to the document from which you are quoting?

Q.—It is the document signed by Mr. Bean and Sir Lawless Hepper showing a cost of about 16 rupees per cubic yard, as against 5 annas per cubic yard.

A.—This is not an audit report. This officer, Mr. Bean, is both accounts officer and audit officer. These accounts he compiles as accounts officer, and this is a review of his own which he made on his own responsibility, and with some of it I disagreed at the time.

Q.—If you will kindly turn to the last page to which I am referring, you will find that besides the accounts officer some other gentleman has also signed it, Sir Lawless Hepper.

A.—Yes.

Q.—Did he put in any note of dissent suggesting these figures were not correct?

A.—He has not.

Q.—Would you assume, therefore, that that shows the total expenditure on the works as worked out by the accounts officer is correct, or have you any explanation to offer?

A.—No; at the time when these accounts came to my hands I protested against the manner in which they had been brought for signature to Sir Lawless Hepper without being scrutinised in the Department first of all.

Q.—What are your objections to them? Will you kindly explain?

A.—Because I should refuse to sign any accounts unless I had an opportunity of scrutinising them; and there is no certificate showing in what capacity the audit and accounts officer has signed the report, and there is nothing to indicate what the parties respectively certified.

Q.—In what material respect do you object to the statement? In what respect is it inaccurate?

A.—I cannot go into details now. That is a matter which Mr. Elgee could offer an opinion on better than I can, I think.

Sir Frederick Hopkinson.—It might help you if I pointed out that this cost included depreciation on capital. We have not in our figures of cost touched on depreciation of capital or interest on capital.

Mr. Billimoria.—That is right. Even if this were eliminated, I should point out the figure is far exceeded.

A.—May I mention another point? I think this statement also included the results for the "Kalu" which in 1924-25 was only working for about an hour and a half a day when it could work. It was then mostly idle.

Sir Frederick Hopkinson.—That could not be included if you are taking the total cost of the dredger.

A.—Quite so; but it was by itself misleading, perhaps.

Sir Frederick Hopkinson.—There are several things there which would not be, in any case, comparable with the figures with which we have been dealing. For

instance, it gives establishment charges, and it also gives the Secretariat Department. The Secretariat Department has nothing to do with the cost of dredging in any figures that we have been dealing with.

A.—Quite so.

Mr. Billimoria.—Do you know whether the Auditor-General did not raise objections on several occasions with regard to the estimates having been exceeded?

A.—Do you mean without Government sanction?

Q.—The Government sanction was obtained after the Auditor-General pointed out these things.

A.—There may have been such cases.

Q.—What was the control exercised by the Department? Why were these exceeded until they were pointed out by the Auditor-General?

A.—Unless you give me the actual instance it is very difficult to explain. All I can say is that under the system of pre-audit no bill would have been passed by the audit and accounts officer unless it was within the amount of the sanctioned estimate. Payment stopped automatically as soon as the sanctioned estimate was reached.

Q.—All those objections are on the records and will not go further. They are all printed. If you estimated 11 years for the disposal of the entire area which constituted 22 lakhs of square yards of land, it would give an average of two lakhs of square yards for disposal every year?

A.—Yes.

Q.—Do you expect the land in that area to be disposed of at an average of two lakhs of square yards a year now?

A.—That is entirely a matter of price. If you put the land up at one rupee a square yard you would dispose of it in 24 hours.

Q.—At the price of 50 rupees a square yard do you expect it?

A.—Not at present.

Q.—You recommend that the scheme should be completed as such, but if the land could not be disposed of would you recommend that the scheme should be completed, or that you should go cautiously and slowly?

A.—Do you mean would I recommend now that the scheme should be prosecuted continuously to a conclusion?

Q.—Yes.

A.—No.

Q.—Could you tell me what is the access to the reclamation area for people to come to it? There is the railway line and there is no other approach. How are people to go over in blocks 1 and 2? What is the access there? Did anybody think of that?

A.—Yes; the B.B. & C.I. Railway are under an obligation to remove the railway line from Church Street station to Colaba station within a fixed date.

Q.—So you expect the public to have access to blocks 1 and 2 *via* Church Gate—going up Queen's Road and going through to that block?

A.—And from the Chaupatti end.

Q.—What is the access through the Chaupatti end? That is also a long way round. People will have to walk all the distance from Chaupatti to go to the Marine lines?

A.—You can come round right down along from Chaupatti and proceed right along the front.

Q.—Provided you have a motor-car. Taking ordinary people who have not the luxury of a motor-car, how can they have any access to that? How can they reach these blocks? There are no over-bridges contemplated.

A.—I do not think I follow you. People go to Chaupatti at present on foot.

Q.—Is that the only way that you think is the right way of developing this area without getting access to that? There is not any road by which you can reach block 1. The line would run through all this portion up to Colaba (*pointing on the plan*). People would have to cross that and there are no bridges to reach this place. You will have to build some over-bridges which would have to be provided for in your estimate.

A.—The only part which is not directly accessible is the Recreation Ground in Block 1.

Sir Frederick Hopkinson.—Where is the future terminus of the B.B. & C.I. Railway. Is it Church Gate?

A.—Yes.

Q.—The point Mr. Billimoria is making is that there is no direct access across the Railway unless you go right back to the Marine lines?

A.—For people debouching along this road, for instance, there is no access except footbridges, but there are footbridges.

Sir Frederick Hopkinson.—It would be a very simple matter to put a couple of footbridges here.

Mr. Billimoria.—What about the other people, carriages that want to go round Church Gate Station? If you are really developing this area you would require some bridges there, and a number of them if the whole area had to be reclaimed?

A.—I do not agree.

Q.—Do you not?

A.—No.

Q.—Do you think that any land which is not accessible will realise a better price?

A.—I think the access would be ample when the Railway betwen Church Gate and Colaba is removed.

Q.—That is your view?

A.—Yes.

Sir Frederick Hopkinson.—Is there an actual agreement between the Government and the B.B. & C.I. Railway that the railway is to be done away with south of Church Gate?

A.—There is an agreement between the B.B. & C.I. Railway and the Secretary of State under which the Secretary of State can give them notice.

Q.—At some time?

A.—There is a limit. I forget the exact year.

Q.—He can give them notice to discontinue running south of Church Gate?

A.—Yes.

Q.—Has he to give it within a certain time?

A.—I think the notice has actually been given.

Q.—It has?

A.—I think so.

Sir M. Visvesvaraya.—Did you say the notice has been given?

A.—Yes.

Sir M. Visvesvaraya.—Then the railway line will be stopped.

Mr. Billimoria.—There has been some objection with regard to that notice. The Railway Company have said that afterwards, if they want this line to be reinstated, they would not be prepared to do so without compensation?

A.—There have been objections raised, but the fact is they have received notice.

Q.—Are you going to discontinue it? Has that been decided upon in the terms of the notice?

A.—They may resist and they probably will, but so far as I am aware they are bound by the terms on which they hold the line.

Q.—That notice is subject to electrification and the electrification is not complete?

A.—No.

Q.—Is not that so?

A.—No.

Q.—I think that is in the correspondence somewhere?

A.—The Government may have agreed for other reasons not to give notice until the electrification scheme is completed, but the terms on which the B.B. & C.I. Railway hold the line were framed long before there was any thought of any electrification scheme. It goes back 30 or 40 years.

Chairman.—Are you satisfied that the Government can, if it has not already done so, give them notice to discontinue running south of Church Gate?

A.—Perfectly satisfied.

Sir M. Visvesvaraya.—Then where will be the terminus?

A.—Church Gate Street would be the terminus for the suburban traffic. The terminus for the long distance traffic will be either at Grant Road or Victoria Terminus, but so far as I know that question is not decided.

Sir Frederick Hopkinson.—There will have to be some trams taken on to Church Gate or some other means of communication?

A.—Yes, or buses.

(*The Witness withdrew.*)

The Committee Assembled at 2.30 p.m. on the 4th October, 1926, all the Members being present.

47th Witness, Mr. E. W. Knight.

Chairman.—What are your Christian names?
A.—Ernest William.

Q.—In the spring of 1912 were you assisting Mr. Kidd in the wash-borings in the harbour of Bombay?
A.—Yes.

Q.—Were you one of what he describes as the Observers?
A.—I was his foreman.

Q.—He says: "Two observers, both non-commissioned officers of the Royal Engineers, were employed, one on each craft, who got the craft into line, observed and recorded positions and measured and recorded depths and tide gauge. They also acted as foremen in charge?"
A.—That is correct, except that I was not a non-commissioned officer in the Royal Engineers at that time. I was an ex-non-commissioned officer in the Royal Engineers.

Q.—He refers to you as being on one of the craft and a colleague on another craft?
A.—Yes.

Q.—About how long were you employed in taking these borings?
A.—I went out from England, I think on the 21st January. I was back here again, either late in June or early in July—I forget at the present time exactly when as it is a long time ago to remember.

Q.—You went out to Bombay specially for this work?
A.—Yes.

Q.—Were you in Mr. Kidd's employ before that time?
A.—No, but prior to that I was Inspector of Government against him when he was building the Bombay Breakwater.

Q.—Were you familiar with the Bombay conditions?
A.—Yes, very familiar.

Q.—How long had you been concerned with the harbour and breakwater?
A.—I was in the Submarine Mining Corps in Bombay for a matter of six or eight years, surveying and laying mines in the harbour, and I was about 4½ years as Inspector of Bombay Breakwater for Government as non-commissioned officer of the Royal Engineers.

Q.—That was before 1912?
A.—Yes, that was in 1896 onwards.

Q.—Had you ever taken wash-borings before you began this work for Mr. Kidd in 1912?
A.—Not wash-borings but other kinds of borings.

Q.—By "other kind of borings" you mean borings with core drill?
A.—Ordinary American rod drills—the ordinary rod drills.

Sir Frederick Hopkinson.—With an auger at the end?
A.—Yes.

Chairman.—A shell auger?
A.—A shell auger or a drill or whatever the case may be—whatever you were called for to do.

Q.—That is a recognised method of taking borings, is it not?
A.—Well, for certain types of work.

Q.—Would boring with a core drill or a shell auger have been appropriate in Bombay Harbour?
A.—It would not have been as efficient as the method employed by Mr. Kidd.

Q.—Why not?
A.—Because his method was a very, very simple method and very, very effective in my opinion—accurate and effective.

Q.—But are not the methods of core boring and boring by shell auger perfectly certain in their operation?
A.—I should not say so. I should not say they would be any more efficient or as efficient as wash-boring for mud, which is what we were boring for. We were only trying to find how much mud was on the rock then in Bombay Harbour.

Q.—You can get through mud with wash-borings?
A.—Yes.

Q.—The difficulty begins when you are getting into stiff and unctuous clay, does not it?

A.—I do not know that there would be very, very great difficulty in getting through anything until we got to the rock in Bombay Harbour.

Q.—But generally speaking with wash-borings is not it an almost impossible method of getting through stiff clay?

A.—I never tried it.

Q.—What do you say?

A.—I do not know that I ever tried it.

Q.—Let me describe it and you will tell me if I am describing the method that you employed accurately. You had lengths of metal pipe with an internal diameter of 2 inches?

A.—I am not quite sure whether it was 2 inches or 2½. It is a long time ago to remember. It may have been 2½ inches or it may have been 2 inches so far as I know.

Q.—At this lapse of time it is impossible to remember a detail like that?

A.—And I have lost my notes.

Q.—We have Mr. Kidd's statement and he speaks of it as 2 inches?

A.—I should say that is correct but I have lost all my notes.

Q.—So far as your recollection goes?

A.—It may have been 2 inches or 2½ inches.

Q.—An internal diameter of 2 inches?

A.—Yes.

Q.—An external diameter of 2½ inches about?

A.—An ordinary standard tube—the ordinary water tube.

Q.—The question I asked was, an external diameter of 2½ inches?

A.—It may be or it may not be; I cannot tell you from memory.

Sir Frederick Hopkinson.—Slightly less?

A.—I should say less.

Q.—But practically 2½ inches?

A.—Yes.

Chairman.—At the end of the pipe the end was constricted down to——?

A.—Less than 1 inch.

Q.—According to Mr. Kidd down to 1 inch?

A.—I could not argue about that. I consider it was considerably less. It was a reducing socket screwed on to the end of this tube, and as far as my memory carries me it was about ½ inch.

Q.—So be it. A reducing socket is rather like the point of a pencil?

A.—Exactly, an ordinary reducing socket—a standard reducing socket screwed on.

Q.—Do you remember what lengths these pipes were in?

A.—No, I cannot tell you. They were in standard lengths. We cut them in standard lengths and screwed them, but I forget what they were. They were all in sections so that there would be no mistakes in calculating.

Q.—You had several lengths of these pipes which you were able to screw together and get down through what you describe as the mud?

A.—Yes.

Q.—First of all the apparatus with yourself and the other men was on a moored raft, was it not?

A.—Yes.

Q.—You took up your position by a series of cross-bearings so that you would know exactly where you were on the surface of the harbour?

A.—Yes, we had a line of cross-sections from a base line running along the shore, and we hauled out with anchors a certain given distance—whether they were 100 feet or 100 yards I have forgotten now—they were either 100 feet or 100 yards. That was hauled out and then angles were taken by a sextant from that alignment and checked the cross-sections from each end of the base line observation.

Q.—So that you would be able to record your position in the harbour accurately day by day?

A.—Reasonably accurately. It could be checked when it got into the office by the protractor to see whether we were to lay the pipe or whether we were not to, whatever the case may be.

Q.—The process was, was it not, that you lowered this 2-inch pipe with its reducing socket down through the sea until you touched the mud?

A.—Until we touched the top of the mud.

Q.—You may have to screw on three, four, five, six or seven sections, according to the depth at which you were working?

A.—Yes.

Q.—According to the statements that have been made you did succeed in passing through the mud right down, I think, to 70 feet in depth to moorum or rock?

A.—Always, we always got to something hard, whether it was moorum or whether it was rock. It was hard. We went down till we got no further.

Q.—In this system of wash borings you drove water by a hand pipe down through the hollow pipe, did you not?

A.—Yes.

Q.—That being forced out at the end of the reducing socket enables the pipe in theory to sink through the mud?

A.—Yes.

Q.—That is the object of it?

A.—That is the object.

Q.—What sort of pressure was the pump giving?

A.—To the best of my recollection we tested some of that and I think we got up to between 80 and 100 per square inch, but I will not be absolutely sure—at least 80, anyhow.

Q.—Then when the reducing socket, the penetrating end of the pipe, touched the mud, did it sink by its own weight assisted by the water which was being pumped through?

A.—Not always.

Q.—Did it sink through any part of the mud?

A.—Yes.

Q.—About what depth of mud would it usually sink through?

A.—It would be just according to what the type of mud was. In some parts of Bombay harbour you get slurry on the top, and when you get out further you get a more consolidated type of mud.

Q.—You get the consistency of the material varying in different parts of the harbour?

A.—Exactly.

Q.—Some of the mud quite soft?

A.—Yes.

Q.—Take the softest type of mud, about how far down would the pipe sink of its own weight?

A.—That is a pretty tall question after all these years.

Q.—I know that we are dealing with things which happened a long time ago, but we want to get the best of your recollection.

A.—Sink without assistance?

Q.—Yes; without assistance.

A.—I should think we would go down about 6 to 8 feet at the top part of the slurry.

Q.—Then when you speak of assistance, how did you get it down through the denser material?

A.—We had tackles on the end of the tube and a flexible portion on the top from the pump, and we raised and lowered the pipe with those tackles, and the men jumped it down the same as you jump an ordinary drill just to clear the ordinary pressure of water and get a flow of water on to the mud, which would clear the mud away—a succession of lifts and drops, and lifts and drops.

Q.—Were you taking notes of each of the borings? Was that part of your duty?

A.—Yes.

Q.—On probably one-half of this area?

A.—I should think so. I should think I did more than half of it.

Q.—The document to which I am now referring is " No. 308, chief engineer's office, Back Bay reclamation scheme, general plan showing borings taken in Harbour." You are responsible for about half of the figures recorded on this plan?

A.—I should think so. I do not know about the figures recorded on the plan, but I am responsible for the figures that were sent in to the office by me.

Q.—You passed the figures into the office?

A.—Yes.

Q.—One would presume that they were correctly put down here on the plan. As I understand it, you took no borings which would bring up to the surface the strata through which your pipe passed?

A.—We did get that on several occasions.

Q.—You mean mud adhering to the tube?

A.—No; if we stopped pumping what was in the bottom of the tube would be the strata you were in You pulled it up to get it.

Sir Frederick Hopkinson.—When you pulled the tube up?

A.—Yes; we pulled the tube up many times to inspect it.

Chairman.—How would you described the material that you found on occasions in the reducing socket?

A.—I think all we ever got there was mud and blue clay. That was the description.

Q.—Up to now you have not told us anything about the wash borings penetrating into blue clay. You have spoken of it up to now as mud?

A.—Yes; there is very little difference between the Bombay mud and blue clay. It is a bluer substance, but it is very similar to mud. It is stiffer, that is all.

Q.—As you got down deeper and deeper was there a greatly increased resistance?

A.—Yes.

Q.—Would it be a fair description of the clay to call it hard clay?

A.—No; I should not think so.

Q.—Would it be a fair description to speak of it as a stiff clay—the blue clay?

A.—Yes.

Q.—Stiff?

A.—Yes.

Q.—This plan has a large number of small circles on it which indicate the position of each boring, and the references say: "The black figures indicate the surface of mud." Does that mean the top figures, do you know?

A.—I should think so.

Q.—Then: "The blue figures indicate the surface of blue clay." In fact, on this plan there are no blue figures, they are all black?

A.—Yes.

Q.—Would that be a middle figure?

A.—I cannot tell you.

Q.—Take any one of these you like. They are all black figures, are they not?

A.—Yes.

Q.—The reference which is closest to your right hand says: "The black figures indicate the surface of mud."

A.—Yes.

Q.—On that plan there are no blue figures, but is not that meant as the middle figure of the three?

A.—I cannot answer that question. I do not know anything about the plans. The plans are all prepared in the office after our work is done, and I cannot tell you that from memory.

Sir Frederick Hopkinson.—That is not the original drawing. The original drawing has been traced, and that is a print from the tracing. That is why the figures are black —the colours did not come out.

A.—It is the middle figure that is blue.

Sir Frederick Hopkinson.—Apparently that is it.

Chairman.—The plan shows in some places a depth of as much as 30 feet of blue clay. You can take that from me. How long would it take you to get your pipe through a depth of blue clay of 30 feet?

A.—I cannot tell you. It is a long time ago now. It used not to take very long. Some holes were stiff and some were easier than others; but I forget now. I cannot tell you how long we were getting down.

Q.—You say some of the blue clay was stiff. Was some of the blue clay easier?

A.—Yes; when we were down in the places outside Sunk Rock it used to take us a good long time to get down. It was pretty stiff going through there. But I cannot give you in time how long it took us—it is a long time ago.

Q.—Do you mind looking at the map? Where is Sunk Rock?

A.—It is the next lighthouse to the Prongs in Marine Lines.

(The position of Sunk Rock was pointed out on the plan.)

Q.—You say the area round about Sunk Rock was very stiff?
A—.Yes; this cross-section between Oyster Rock and Sunk Rock.

Q.—There the material was very stiff in character?
A.—Yes.

Q.—The material in block K, according to you, would be very stiff?
A.—Yes; getting well out towards Sunk Rock. It is right outside Oyster Rock. It is not much inside Oyster Rock. It is outside *this* way. (*Pointing on the plan.*)

Q.—Who told you what apparatus was to be used for the purposes of these wash-borings?
A.—Mr. Kidd.

Q.—Was he out in Bombay at the time when you began?
A.—He came out a week after, practically at the time we began. He came a week after we left England. He followed us one ship behind.

Q.—He followed you out?
A.—Yes; we were out getting ready. He was out in time to see the first boring.

Sir M. Visvesvaraya.—Roughly speaking, what time did it take you to lower the pipe through 10 feet of hard clay or stiff clay? Mr. Kidd says the whole thing took 20 to 30 minutes to get through 30 feet.
A.—He is giving you a limit. It is somewhere about that.

Q.—Each boring took 20 to 30 minutes?
A.—Yes; when we got out on stiff stuff it took you some time.

Q.—The whole operation?
A.—From one point to another.

Q.—To complete the whole boring?
A.—It is just according to how far you are going down. Do you mean in 10 feet only?

Q.—The whole length, say 30 feet.
A.—The connecting up and boring, and everything?

Q.—Yes.
A.—I should think about an hour.

Q.—What was the maximum pressure you applied?
A.—80 to 100 lbs. per square inch—I cannot say which.

Q.—That is 230 feet. Did you pierce through the moorum to any depth at all?
A.—We may have got into a little bit of moorum. We could not get very far through the moorum.

Q.—Soft moorum?
A.—We might get down a foot or 18 inches into the soft moorum; you would not get further.

Sir Frederick Hopkinson.—What sort of pumps did you use?
A.—Semi-rotary pump, 2½-inch bore.

Q.—Worked by one man?
A.—Two, and four sometimes.

Q.—Did it have a long handle on?
A.—We duplicated the handles.

Q.—A semi-rotary pump is rather awkward to work with more than two men?
A.—Yes. To the best of my memory we duplicated it and put a long handle on and made it into a kind of 45 degree angled thing. I forget how it was but we had four men on sometimes.

Q.—Did you have india-rubber pipes from the pump outlet to the top of the boring pipe?
A.—Canvas hose. As a matter of fact we had both, both rubber and canvas, chiefly canvas.

Q.—What sort of connection did you have?
A.—Brass union.

Q.—To the top of the pipe?
A.—Yes.

Q.—Your suction pipe would be thrown overboard?
A.—The suction pipe was thrown over the side of the raft.

Q.—Did you have a pressure gauge on the pipe?
A.—Not always. We had a pressure gauge for testing purposes to find out what pressure we were actually getting. We got a gauge to find out exactly what pressure we were getting. We did not use the gauge always. We used it just to find out what pressure we were capable of getting.

Q.—Where was the gauge fixed?
A.—Now you have got me. It would be on the delivery I suppose.

Q.—Not on the canvas delivery?
A.—No, certainly not.

Q.—Nor on the vertical pipe?
A.—No.

Q.—Can you remember where it was fixed?
A.—I forget at the present minute.

Q.—It is rather important. I wish you would try and remember.
A.—We used to take pressure anyhow on the delivery. I forget where we connected the gauge.

Q.—You do not remember where the pressure gauge was fixed?
A.—No.

Q.—How often did you use the pressure gauge. If it were fixed on the pump there would be no reason why you should not use it for every bearing?
A.—Yes, but we did not think it necessary to use it. We used the pressure gauge for our own information to see what pressure we were accustomed to get. It was of no value to us, knowing what the pressure was, so long as we were getting through. We just did it to find out what we could get on these pumps.

Q.—Whose idea was it to put a pressure gauge on?
A.—I forget that. Presumably Mr. Kidd's.

Q.—Could you tell when your pipe touched the blue clay after getting through the mud?
A.—You could.

Q.—It refused to descend?
A.—It refused to descend. Sometimes we used to have to draw it up and clear it. We used to find it had choked and we had to clear it out.

Q.—It was choked with clay?
A.—Yes.

Q.—You just lifted it out of the hole and pumped into it?
A.—Sometimes we had to unscrew it and clear it.

Q.—It got properly choked?
A.—Yes.

Q.—Did you get any samples of the clay at any time?
A.—Yes.

Q.—What size of pieces?
A.—The same size as the bore of the pipe.

Q.—Do you mean you brought up core?
A.—Yes, we would get core by stopping pumping at any time and pressing the pipe down with half-a-dozen men. You could press it in and get samples.

Q.—That would be a ½-inch pipe?
A.—Half-inch, and it would practically get loosely inside.

Q.—You could squeeze the ½-inch nozzle end of the pipe into the clay?
A.—Yes.

Q.—Stop your pump, pull it out, and extract that as a sample?
A.—Yes.

Q.—What sort of clay was it?
A.—Ordinary Bombay blue clay. It is very like blue clay.

Q.—Will you take that sample. (*Sample of clay handed to the witness.*) Was the clay you got up anything like that?
A.—No.

Q.—Nothing like that?
A.—No.

Q.—You would have a difficulty in getting a pipe with a hand pump into that?
A.—It is just according to what it is like when it is wet.

Q.—It is not soft?
A.—No, but you would get through that I should think.

Q.—You think you would with a hand pump?
A.—I should think so, not as it is but when it is wet.

Q.—When it is saturated?
A.—Yes.

Q.—Is that anything like the end of the pipe? (*Sketch showing reducing socket from 2 inches to ½ inch handed to the witness.*)

A.—Yes, that is it.

Q.—Supposing that is the surface of the clay your water jet (because it becomes a water jet now) has to wash out a hole as big as the external diameter of the pipe above it?

A.—Yes, it washes round here until it has got that size.

Q.—What volume of water did you pump? A semi-rotary pump gives you a very small volume.

A.—I forget what the suction was. It was a fairly good volume.

Q.—It is not a question of the size of the suction. It is a question of how much the pump valves would pass. Semi-rotary pumps are not fitted for any rapid delivery?

A.—No, they are not.

Q.—Is not it customary that in all borings of this kind you want a large volume of water to enable the pipe or pile to descend through the material?

A.—Yes.

Q.—Do you think that a ½-inch orifice at the bottom of the pipe would really give sufficient water to blow out that clay in a hole large enough for the pipe to descend through it?

A.—Well, it always got down to the rock in Bombay Harbour.

Q.—Rock or moorum?

A.—Yes.

Q.—It did?

A.—Always.

Q.—Did you find the clay varied at all from the top to the bottom in hardness?

A.—From the top of the clay to the bottom of the clay do you mean?

Q.—Yes.

A.—It varied. The further you got down the harder it got. The pipe went down with greater difficulty the further you got down.

Q.—That might be due to friction on the pipe?

A.—It might be due to friction.

Q.—You really had no means of telling unless you took samples, whether the clay actually varied in character?

A.—No, I would not like to say.

Q.—You said just now that you took notes of all these borings. I did not quite catch what you said about that. Have you got them now?

A.—No, I lost them. I was torpedoed and I lost my notes and my books. I got torpedoed coming home—or rather going out as a matter of fact on another job and lost my notes.

Q.—You say you jumped this pipe down. Did you have various pulley ropes to lift it and drop it?

A.—Yes.

Q.—What is the weight of 70 feet of 2-inch pipe?

A.—I cannot tell you.

Q.—You spoke just now about the consolidated type of mud. Do you think there is any real difference between the material that was on the surface and at the bottom, except that it was more consolidated. Do you think the mud was of the same character as the clay?

A.—No. The mud is considerably blacker. It has the same texture. There is no grit or anything of the sort in it. There is no grit in any of the Bombay mud.

Q.—Therefore it would not be correct to call it silt?

A.—At the top?

Q.—Yes—it is mud, is it not? Silt usually means a large proportion of sand.

A.—Yes.

Q.—Therefore you would call this mud?

A.—Yes.

Q.—Not silt?

A.—Slurry or mud.

Q.—I have seen men walking in it up to their arm-pits?

A.—Yes.

Q.—That is the sort of stuff?

A.—Yes. You get that on the top in Bombay. You get that everywhere in Bombay Harbour.

Q.—So that your pipe would drop into that at least 6 feet?
A.—I should think so.

Q.—Without any appreciable resistance?
A.—Yes.

Q.—Would you mind telling me what sort of apparatus you used. Did you have two boats coupled together with some planks or boards or something of that kind?
A.—Yes.

Q.—And a cat-head rigged up on top of that?
A.—Yes.

Q.—A tripod?
A.—A tripod in the centre of two rafts. The two rafts were two boats covered with a platform.

Q.—And the pipe in between the two boats?
A.—The pipe and tackle in between the two boats.

Q.—You have four moorings for it?
A.—Yes.

Q.—How long did it take you to move from one place to another?
A.—It was according to what the tide and wind was like.

Q.—About how long?
A.—Something like half an hour.

Q.—How long would it take you to make a boring, supposing you got mud and 30 feet of clay?
A.—Approximately an hour I should think.

Q.—Roughly speaking 1½ hours for a boring?
A.—Yes.

Q.—That is pretty quick?
A.—Yes.

Q.—You did not lose any time?
A.—No; it is a long time ago.

Q.—I quite appreciate that, but it is pretty quick work?
A.—Yes; it may have been longer.

Q.—You evidently did the whole work very quickly?
A.—Yes; it is a very quick job.

Q.—I suppose Mr. Kidd wanted it done quickly?
A.—Yes.

Q.—It is no mean job to take 1,300 borings in 3¼ months?
A.—That is so.

Q.—You said to the Chairman just now that the wash boring system was more efficient, effective, and accurate than the core boring.
A.—For that type of boring, soft mud boring.

Q.—I am speaking of the clay now.
A.—For the stuff that we found in Bombay harbour.

Q.—It could not be as accurate because you could not get at the core; or do you mean that the stuff was so soft that you could not, with a core drill, get up the proper core?

A.—You could get it.

Q.—You could?
A.—Yes.

Q.—Therefore, that would certainly be more accurate than wash boring, would it not?

A.—I do not see why it should be.

Q.—Because you would pull the actual stuff out from a defined depth.
A.—You could do the same with wash borings.

Q.—No; because you do not see what is going on until you pick your pipe up.
A.—You stop pumping and push it down. The water is all out, and you get the impression of the stuff—of what you have got.

Q.—Did you often do that?
A.—Yes.

Q.—You said just now that it was soft light blue clay in the harbour. Would you call that sample ordinary light blue clay?

A.—No; this is a different type of stuff altogether. This is clay mixed with some kind of moorum.

Q.—With a little kankar?
A.—Yes.

Q.—Little bits of lime?
A.—Kankar.

Sir M. Visvesvaraya.—This sample was picked up from the reclamation area?

Sir Frederick Hopkinson.—Yes.

Sir M. Visvesvaraya.—So it is not natural material.

Sir Frederick Hopkinson.—You had never done wash borings before, I think you said?

A.—No; this was my first experience of wash borings.

Q.—How could you tell directly you got through the mud that you got on to the clay?

A.—You could tell by the different way the pipe went down. You could not get it down through that without using force. You had to keep easing the pipe and jumping it.

Q.—But jumping alone would not take it down?
A.—Jumping, and the pressure at the same time.

Q.—Jumping alone would not take it down?
A.—No.

Mr. Billimoria.—Were you satisfied that there was sufficient material available in the harbour for reclaiming 1,145 acres?

A.—That question had nothing whatever to do with me. I did not see the finish of the work. I was only employed on getting the borings and handing in my results to the office. The other part of the work was probably in the offices at Bombay and Poona.

Q.—Did you find that this material was suitable for reclamation purposes?
A.—That is not for me to say. I was not interested in that.

Q.—Was the boring taken on an exhaustive scale?
A.—Exactly.

Q.—To prove the existence of the material?
A.—Exactly.

Q.—The borings were taken on a very exhaustive scale?
A.—Yes.

Q.—What did you find the clay to be, soft or hard?
A.—Ordinary Bombay clay, soft, or stiff, or medium.

Q.—Will you kindly explain what you call soft clay, medium clay, and stiff clay?
A.—The usual thing that is found in Bombay harbour.

Q.—Is not there any difference between the various descriptions which you have just now referred to?

A.—Well, it is as I explained not long ago, blue clay or blue mud, whatever you like to call it. It is considerably stiffer than the top portions of it, and that comes out in the samples which have been brought up. It is fine, stiffish, bluish clay, with no grit, or anything of that kind, in it.

Q.—Does the material in the bed of the harbour or bed of the sea change in lapse of time, or does it remain the same? Do you know anything about that?
A.—No.

Q.—If somebody took borings in 1909 for the purposes of reclamation, and if reclamation had to be undertaken in 1919 would you be satisfied with the borings of 1909, or would you get a fresh survey made in 1919 before embarking on the scheme?

A.—Well, that is a pretty big question. It is just according to whether any changes have been made in the harbour.

Q.—Ordinarily, supposing somebody was sent out in 1909 for investigation purposes and the scheme was not taken in hand, but later on after 10 or 12 years it was found advisable to undertake the scheme, would you go on the estimates of your investigations of 1909 or would you have a fresh survey made in 1919?

A.—I do not know. It is just according how much I knew about the original one.

Chairman.—You told me and Sir Frederick Hopkinson that it was ordinary light blue clay?
A.—Yes.

Q.—You have told Mr. Billimoria that it was stiff bluish clay. The two things do not go together—stiff and ordinary light blue clay.
A.—I was speaking of the colour of it.

Q.—Ordinary light blue clay is one thing, and stiff bluish clay is another, is it not?
A.—I was speaking of the colour. The colour is of light blue.

Q.—In using the word " light " you were using it in reference to the colour as opposed to density?
A.—Yes.

Sir Frederick Hopkinson.—Do you agree with Mr. Kidd's description of it, that it was stiff clay?

A.—It is a very funny point for me to decide which is stiff and which is not stiff in clay. Taking the stuff that we got out of there, as you went down through the top stuff you got into mud, which has slurry stuff on the top, and then it gets a little bit stiffer, and it gets stiffer and stiffer the further you go down.

Q.—Stiffer in the sense that it is more difficult to push the pipe down?
A.—Yes.

Q.—That would be natural, because you have so much more skin friction on the pipe?
A.—Irrespective of that.

Q.—How do you know that?
A.—Because I have seen it brought out of the harbour in the same manner.

Q.—You have seen variations in the quality and character of the clay?
A.—Yes.

Q.—Would you call it generally stiff clay or soft clay?
A.—Well, it is not as stiff clay as you would meet outside in the sea.

Q.—Do you know the London clay?
A.—Yes.

Q.—Is it as hard as that?
A.—No.

Q.—Can you compare it with any clay you know of in England?
A.—No; I cannot. It is too fine.

Q.—Is it harder than bungum?
A.—No.

Q.—That is also blue?
A.—Yes.

Q.—That is material you get in the Humber?
A.—I have worked in the Humber.

Q.—You ought to know bungum.
A.—I have worked at Immingham on the docks there.

Q.—Did you not get bungum there?
A.—I was on the docks entrance there.

Q.—Did you not get bungum there?
A.—I do not know what it was called.

Q.—It is blue soft clay. You would hardly call it clay. Did you ever go over to the King George Dock?
A.—Yes.

Q.—Did you see bungum there?
A.—I saw plenty of clay there. I was diving there at the entrance to Immingham Dock a good many months removing clay, as a matter of fact; removing the entrance there.

Chairman.—Thank you. (The Witness withdrew.)

(Adjourned to 5th October, at 11 a.m.)

The Committee Assembled at 11 a.m. on the 5th October, 1926, all the Members being present.

48th Witness, Mr. William Kidd, M.I.C.E.

WRITTEN STATEMENT.

1. In answer to the telegram dated Bombay the 6th August, from Sir Grimwood Mears to me stating that important questions had arisen regarding the borings referred

to in the project prepared for the Government of Bombay by Messrs. Lowther, Kidd & Co., in 1912, and asking for further information, the following statement has been prepared.

2. The Enquiry Committee desire to know in greater detail :—

(*a*) How long the borings continued?

(*b*) What methods were employed? and

(*c*) With what results?

3. Before proceeding to answer these enquiries, a short resumè of the proceedings which led to the preparation of the 1912 project may be given.

I.—Preliminary.

4. My first connection with the project arose in 1910 when I submitted a preliminary suggestion to the Government of Bombay that the old idea of the reclamation of Back Bay might be revived on the basis of the requisite filling material being obtained from Bombay Harbour instead of from the adjacent hills, as in the first project belonging to the sixties of last century. In making that suggestion it was accompanied by a statement that its feasibility depended entirely upon whether the requisite material was available in the Harbour, that no sufficient or reliable information existed on that question, and that a complete survey would be necessary to settle it.

5. Three possible sources from which to obtain material had been considered before that view was expressed, viz :—

(1) Dry material—" Moorum " from the foot-hills outside of Bombay.

(2) Dredged material from Bombay Harbour.

(3) Dredged material from Back Bay.

With regard to (1) it was concluded that having regard, among other things, to the position of the sources of supply available and the cost of transport, the cost would be prohibitive.

6. With regard to (2) and (3) it was at once apparent that Back Bay was part of the open ocean, subject to the full forces of winds and seas. Observation of the Bay during a stay in Bombay extending from 1904 to 1908 had shown me that from the month of April or May to the month of September or October, in some years both months included—dredging operations in the Bay would be impossible; indeed for the greater part of that time the dredger and pipe-line would have to take shelter within the Harbour. In addition to that, for a great part of the remaining six months of the year, dredging operations would be seriously interrupted by the heavy ground swell which prevailed; and which, even when it was not heavy enough to prevent dredging work altogether was yet heavy enough to seriously interfere with its efficiency and to cause risk of serious damage to the dredger when working, its ladder and cutting apparatus being then in contact with the sea bottom. Thus for five or six months of the year dredging operations are impossible, and there is a further three months during which a swell prevails, heavy enough to interfere seriously with the efficiency of these operations and cause serious risk of damage to the dredger.

7. A rough preliminary survey of Back Bay was made in the spring of 1910 with the sole object of ascertaining whether the sand indicated on the Admiralty Chart in parts of the bed of the Bay, existed in thick or thin deposits? Spot Soundings by means of a steel-pointed probe were made over an extensive area with the result that in most cases a hard rock bottom with little or no sand was found, and in the others some two or three feet depth, only, of sand was proved.

8. These considerations—particularly those of the sea conditions—led to the conclusion that if the requisite material could be obtained from the Harbour there could be no question as to its being the preferable source.

9. Had the result of the Survey of the Harbour proved unfavourable, no doubt Back Bay as the only practicable alternative source would have been further investigated by a more complete survey, but the result of the Harbour Survey being what it was Back Bay was deemed to be defintely inferior to the Harbour as a source from which to obtain the filling materials.

10. In the course of carrying out the works of the extension of the Royal Indian Marine Dockyard between 1904 and 1908, a considerable quantity of dredging work was done which afforded ample opportunities of seeing the nature of the materials forming the bed of Bombay Harbour. These were of three kinds, viz :—

Soft Mud;
Blue Clay;
" Moorum " and rock

lying over one another in the order named.

11. I had occasion during the same period to make such careful study of the strata in another part of the Harbour as was necessary for the preparation of a tender for the important work of the Sewree Reclamation of the Bombay Port Trust. This study included the sinking of borings in the vicinity of the proposed work. I had subsequent opportunities of seeing the dredging work in progress and satisfying myself of the nature of the strata there. I had, moreover, opportunities of seeing from time to time the construction operations of the Alexandra Dock, and of examining the ground there. In all cases the nature of the ground proved to be the same—viz :—mud alone or mud succeeded by blue clay, overlying the " Moorum " or rock, all the materials being uniform in character in every case.

12. The mud needs but little description, being a recent alluvial deposit brought down by the rivers discharging into the Harbour during the Monsoon rains; consisting of loose material washed down from the slopes of the hills surrounding Bombay Harbour which consist of basalt, the surface being converted into " Moorum "—a kind of brown earth resulting from the decomposition of the original basalt rock. The mud is very soft on the surface, gradually stiffening as it increases in depth. Although very soft when freshly dredged it produces firm ground when deposited on a hard bottom after becoming settled and dried.

13. The Blue-clay underlying the mud proved in the course of dredging operations at the R.I.M. Dockyard to be of such a character as to yield exceptionally favourable results in dredging work in consequence of the fact that its consistency is such that in working a bucket-dredger the normal output of the machine is doubled or more than doubled. This happened because the spaces between the buckets ran nearly solid in addition to 100 per cent. full-buckets. The material takes and retains the impress of the rivets of the buckets; being of the consistency of butter at a normal temperature.

14. Between 1904 and 1907 a cutter-dredger had been employed in dredging a deep water channel in Lake St. Peter in the River St. Lawrence leading up to Quebec. I had obtained particulars of the design and working of the dredger in connection with my estimates for the Sewree Reclamation. The striking feature of the case was the similar character of the material in the St. Lawrence to the blue-clay in Bombay Harbour. Indeed, as far as could be judged from the very particular description given in the information I had obtained, the blue-clay was either identical or very similar. The results of the working therefore assumed great importance in forming my conclusions in respect both of Sewree and Back Bay. It appeared to be completely established that blue-clay had been successfully dealt with by a cutter-pump-dredger and that, provided the power of the cutting and pumping machinery were proportionately increased to the output required and the longer delivery pipe, similarly good results could reasonably be anticipated in Bombay.

The dredger " I Israel Tarte " exerted about 1,200 horse power and cost but £32,760 at American prices, but it carried out its work of dredging over 3,500,000 cubic yards at an average cost of under 8 cents of a dollar (gold)—say 4d. per cubic yard.

15. I had in the Spring of 1912 an opportunity of seeing the dredging of the blue-clay by a cutter-pump-dredger tested on a practical scale in Bombay Harbour. The Sewree Reclamation was then in progress, and following a discussion I had with the then Chief Engineer of the Bombay Port Trust the dredger " Jinga," which had until then been confined to dredging the soft mud overlying the blue-clay, was then put to the blue-clay itself.

The data of the results subsequently supplied to me by the Chief Engineer are not sufficiently precise to yield the exact relative figures of output as between blue-clay and mud, but they shew that in the period which included the operations in blue-clay there was an increase of 19 per cent. over those for the total periods in which the operations were wholly in mud. The material dredged no doubt included a small proportion of mud, inasmuch as the clay cannot in practice be dredged without the adjacent and overlying mud being included. I have seen one of the areas into which reclamation was divided for construction purposes satisfactorily filled with the blue-clay. The dredger experienced no difficulty in cutting and discharging it through a delivery pipe 4365 feet in length, though I did not regard the pumping machinery on board the " Jinga " as being highly efficient.

16. This experience and information as to the character of the materials forming the bed of Bombay Harbour was available when I undertook the Survey in 1912, with the exception of the experience of the working of the " Jinga " in blue-clay at the Sewree Reclamation, the results of which I saw while the Survey was in progress and of which I subsequently obtained the data.

17. The position when I was called upon to undertake the Survey incidental to the preparation of the project of 1912 has now been described.

II.—Borings for 1912 Project.

(*a*) *Committee's question* : " How long the borings continued? "

18. At the request of the Bombay Government I proceeded to Bombay arriving there in January, 1912. I had been preceded by my chief assistant who was making preparations according to my instructions to commence the boring operations when I arrived. The apparatus was of such a character that preparations were quickly completed and actual boring operations were commenced early in February, 1912 by the first set of apparatus—a second set being provided and started shortly afterwards. It was known that weather-conditions would remain favourable for the boring operations up to the middle of May or after, and the question whether further sets of apparatus would be required to complete the entire Survey by that date was determined by experience in the early days by the progress of the operations. Being simple in character the munipulation of the apparatus was quickly mastered by the crew; rapid progress was soon being made and it was found that two sets would prove enough.

19. The results in respect of progress were that over 1300 borings—which covered the entire area to be investigated—were completed by about the middle of May, the weather conditions being then such that further borings could have been obtained had it been necessary.

20. The outdoor operations extended from early February until mid-May, 1912, a period of about 3¼ months. Long days were however worked, the crews starting from the shore usually at 6.0 a.m. and seldom returning ashore at the end of the day's work until after dark. In other words the working day was 10 to 12 hours instead of 8 hours as on board the dredgers and similar craft working in the Harbour. The results showed that each machine took 7 to 8 borings per day on the average; the numbers varying with the position and depth of the borings. The programme provided for the sinking of the borings either down to the level of the hard surface—" Moorum " or rock—or, alternatively, to a depth of 70 feet below water level, and this was carried out.

21. The total time spent in the preparation of the 1912 project was 7 months, viz :—January to August—my undivided personal attention being given to it throughout. This is apart from prolonged study devoted to the subject at intervals from 1904 onwards.

III.—The Methods Employed.

22. A brief description of the plant employed together with photographs was attached to the Report on the 1912 project. The boring apparatus was composed of ordinary steam or water tubes and fittings 2 inches internal diameter, bought from the stock of a Bombay merchant. The penetrating end was a diminishing socket—2 inches to 1 inch—attached to a length of ordinary tube; sufficient tubes were screwed together to reach the bottom of the Harbour; these were pushed by hand into the mud until it began to offer resistence. A quarter-bend then attached to the top of the tubes was connected by an india-rubber hose pipe to a hand-pressure pump so that water could be forced down the tube through the reducing socket. When the tubes entered the blue-clay the escaping water found its way through the opening at the lower end and up the exterior surface of the tube, thus reducing the skin friction of the clay gripping the pipe, and so enabled the tube to be readily passed through the clay down to the hard bottom, or, alternatively, to the 70 feet depth as the case might be. The force-pump was kept continuously at work from the time the clay was penetrated until the completion of the boring. The tubes were sunk by hand—some of the crew taking hold of the tubes themselves and pushing them downwards and others pulling downwards on hand lines attached to their upper part—the sinking squad numbered 6 hands.

23. The tubes were drawn occasionally to observe the material contained in the mouthpiece. The materials proved to be throughout (1) soft mud (2) blue-clay (3) where the hard bottom was reached, " Moorum " or rock. There was never any doubt as to when the mud ceased and the blue-clay was entered, the former being very soft—offering small resistence to the tube, and the latter being comparatively stiff and offering sufficient resistence to leave no doubt as to its character; the cutter was moreover examined from time to time so as to verify it. Position observations, levels and the nature of the materials were entered into the journals of the observers on the spot.

24. The apparatus was carried upon a working platform supported by two boats all bolted together to secure a firm structure. An overhead tripod carrying a pulley was provided. The whole was secured in position by a system of anchors enabling the apparatus to be moved into a new position after each operation and securing it there while the boring was being made.

25. Positions were taken up on the section lines previously laid out on the shore by adjustments of the moorings, and as soon as the tubes were sunk, sextant observations were taken by the observers to determine the exact position. A base line had been

adopted with the Prongs Lighthouse and the Dome of the Taj Mahal Hotel as its ruling points, the sextant observations being taken on these points and on the section marks then being worked to.

26. My chief-assistant—a qualified surveyor—laid out the section marks on shore and erected tide-gauges so as to be visible from the boring rafts. Two observers—both N.C.O.'s of the Royal Engineers were employed afloat—one on each craft—who got the craft into line, observed and recorded positions, and measured and recorded depths and tide-gauges. They also acted as Foremen in charge. I personally spent the greater part of the day throughout the entire period in seeing the operations carried out thoroughly with the object of obtaining reliable information. The results were recorded on a large scale plan from day to day as obtained; the records showing :—

(i) The level of surface of mud;
(ii) The level of surface of blue-clay;
(iii) The level of surface of Moorum or rock, or alternatively, the bottom of boring.

That record plan accompanied the report on the 1912 project and it was left with the Bombay Government.

27. It will be understood from the description of the boring apparatus and power employed that it was incapable of penetrating any hard material, or any material that was too hard for efficient cutter pump-dredging. The deepest borings taken passed through as much as 30 feet depth of blue-clay; the fact that an apparatus of the kind described enabled a tube with an external diameter of 2½ inches to be passed through that depth of material in the actual sinking time of 20 to 30 minutes clearly proved that the material was not hard, and left no doubt in my mind as to its suitability for efficient dredging by a cutter-pump-dredger of appropriate design. Moreover its smooth slippery character showed it to be eminently favourable for projection through a long pipe to the reclamation—a very important consideration—and lastly it was particularly favourable for making up new ground in a reclamation. The whole of the material actually penetrated by the boring tubes corresponded exactly with the material actually dredged at the Dockyard extension and the Sewree Reclamation.

IV.—Results of the Survey.

28. These were embodied in the report and plans of the 1912 project, a large general plan showing the positions of the borings and recording in every case the levels of the surface of the mud of the Harbour bed, in many cases the level of the blue-clay and in all cases the level of the bottom of the boring which was either the surface of the "Moorum" or rock, or, alternatively the bottom of the boring where the rock surface was below a depth of 70 feet below water level. From these data the quantity of material available was derived.

29. As to the character of the materials the object was mainly to ascertain whether they corresponded to the materials which had been dredged at the R.I.M. Dockyard and at the Sewree Reclamation at both of which actual dredging operations had been carried out, and where, consequently, the material could be seen and examined under conditions much more favourable to correct conclusions than would have been possible from borings alone. The results established that the materials were essentially the same. They have been described in the report of 1912 and above.

In respect of quantity available the result is summarised in a statement contained in the report that more than three times the quantity of material required had been proved by the borings. In supplement of that statement the following figures have been extracted from my book of calculations for the estimate :—

"(I) *Pumped Filling*

"Total quantity measured to face of sea wall and to finished surface Level 92.00. Cubic feet 724,975,269.

"Deduct : Sea wall	...	2,366,753	
Moorum	...	70,222,007	
			72,588,760
Net total, Cubic Feet			652,386,509
= Cubic Yards		24,162,463.	

"(II) Contents of Mud and Clay in Harbour.

"Total proved. Cubic Yards 109,985,488.

" The pumped filling required being 24,162,463 cubic yards and a ratio of cut to fill of 1.00 to 0.70 having been adopted, gives cubic yards 34,517,804 as the requirements measured in cut in the Harbour,

" and $\frac{34,517,804}{109,985,488}$ = 3.18 times requirements.

" 30th September, 1926."

ORAL EVIDENCE.

Chairman.—Were you engaged from 1904 to 1908 on the extension of the Royal Indian Marine Dockyard?

A.—Yes.

Q.—In what capacity?

A.—As the Agent of the firm of contractors for the work.

Q.—Were you there throughout the whole of those years, or did you go away during the monsoon period?

A.—I went off, with the exception of the first year, 1905. We had commenced the works, I should say, in October of 1904. I stayed throughout the monsoon of 1905 in order to see whether it would be feasible to carry on work during that season; but, having found it to be not a profitable operation to work during the monsoon, I was away in subsequent years

Q.—Did a rotary cutter suction dredger form any part of the plant used there?

A.—Not in that case.

Q.—Have you any personal experience of stiff and unctuous clay ever having been successfully dealt with by a rotary cutter suction dredger?

A.—*No personal experience except that in the year 1912, when I was engaged upon this very survey, I was an eye-witness of what I call the successful cutting of the same blue clay at the Sewri reclamation.

Q.—By what vessel?

A.—By a vessel called the " Jinga."

Q.—Have you followed her very disappointing performances?

A.—Of the " Jinga? "

Q.—Yes.

A.—No.

Q.—Let me tell you a little about them. There was also another vessel called the " Kalu," was there not?

A.—I know them both.

Q.—That was a sister ship to the " Jinga "?

A.—Yes, a sister ship, but a ship which invariably gave enormously inferior results to the " Jinga"

Q.—They were, apart from results, indentical ships, were they not?

A.—I believe so.

Q.—And up till now have you believed that the work of the " Kalu " and the " Jinga " was successful?

A.—At the Sewri reclamation?

Q.—Yes.

A.—Certainly.

Q.—I am now reading from Sir Lawless Hepper's statement, and in addition to Sir Lawless Hepper's statement we have the official record of the joint work of the " Kalu " and " Jinga " as compiled by the Port Trust. The " Kalu " and " Jinga " were each designed to deliver 2,000 cubic yards of material through the pump line, were they not?

A.—Yes, I believe so.

Q.—Per hour. Sir Lawless Hepper says this: " The actual results of the working of the Port Trust dredgers ' Kalu ' and ' Jinga ' were recorded in detail in a report stated to have been prepared by the late Mr. Messent, Chief Engineer of the Port Trust, and printed about the year 1915. Taking the results obtained by actual measurements, the figures are as follows. The ' Kalu ' dredged 1,433,005 Brass. The ' Jinga ' did 2,191,754 Brass, making a total of 3,624,759 Brass. The ' Kalu ' took 6,066 pumping hours to deliver that material. The ' Jinga ' took 5,841, with the result that that is equivalent to an average output of 1,126 cubic yards per pumping hour for both the vessels."

* Mr. Kidd notes that before 1912 no British engineer had had any such experience.

Sir Frederick Hopkinson.—That is each vessel, is it not?

Chairman.—Is it?

Sir Frederick Hopkinson.—The "Jinga" did an average of 1,426 cubic yards.

Chairman.—We must be careful about this. Let me have your figures, Sir Frederick

Sir Frederick Hopkinson.—The "Jinga" did an average of 1,426 cubic yards an hour. The "Kalu" did an average of 903 cubic yards an hour. The average of those two is 1,164.

Chairman.—We must look into this because Sir Lawless Hepper deals with it.

Sir Frederick Hopkinson.—He means the average of the two, I think.

Chairman.—You are satisfied about those figures?

Sir Frederick Hopkinson.—Yes.

Chairman.—Then let us take those figures. The "Jinga" did 1,426 cubic yards per pumping hour. That is 574 less than her guaranteed output.

Witness.—Yes.

Q.—In the neighbourhood of 30 per cent?

A.—Yes.

Q.—Would you regard that as satisfactory?

A.—Not in the nature of the material in which they were working at Sewri for the most part

Q.—The nature of that material was a soft material, was it not?

A.—Well, that brings in a very important point.

Q.—First of all, was it a soft material? I know your other point and I will bring it out in a moment. Was it a soft material?

A.—It was entirely the ordinary mud of the harbour—the ordinary mud overlying the blue clay.

Sir Frederick Hopkinson.—No clay?

A.—No clay in the early stages. That is the point I want to make presently.

Chairman.—There was no clay in the early stages?

A.—No clay, I think, except in the last year in which they were working.

Q.—The "Kalu" did 903 cubic yards. That is less than 50 per cent. of her guaranteed output?

A.—Yes.

Q That would be a very disappointing result?

A.—It would indeed.

Q.—In dredging operations like this, when you put a large amount of money into the plant it is essential, is it not, that the dredger should work to the calculated time?

A.—Surely.

Q.—Otherwise you get overburdened with interest?

A.—Quite so.

Q.—And "on" costs?

A.—Yes.

Q.—And a scheme which might very well be a complete success if the dredger worked to expectation might be a disastrous failure if she gave an output such as that of the "Kalu" and "Jinga"?

A.—Clearly. May I just mention one very important thought which is passing through my mind, which is very well illustrated by the case of these two vessels and the figures you have just given. It is the question of the men who are working. It may be much more a question of the men who are working the machine than of the machine itself.

Q.—This dredging operation of which we are speaking took some four years, did it not—1909 to 1913?

A.—I have data to the middle of June, 1912. I do not know when it was finished.

Q.—July 12th, 1913, it appears to be

A.—No doubt that is right.

NOTE.—Mr. Kidd has noted that his figures do not agree with those of Sir Frederick Hopkinson. Sir Lawless Hepper arrived at the average output by taking the total outputs of the "Jinga" and "Kalu" and dividing them by the total pumping hours of the two dredgers, *i.e.*, 3,624,769 Brass divided by 11,907 pumping hours = 304 Brass or 1,126 cubic yards per hour. Mr. Kidd further points out that the "Jinga" did an average of 1,388 and the "Kalu" 873 cubic yards per hour; the average of the two would therefore be 1,130 cubic yards.

Q.—I can understand your saying that at the outset the men who are working the machine may play an important part; one man may get a good result and the other a poor result; but at all events in the second, third and fourth years you would expect the full output, would you not?

A.—Surely.

Q.—Do you know that, in the belief that possibly it was the men who were responsible for the small output of the "Kalu," the crews were actually changed over —the "Kalu" crew into the "Jinga" and the "Jinga" crew into the "Kalu"?

A.—Yes, I believe so.

Q.—But still no better result was obtained?

A.—That I do not know.

Q.—On page 208 of the evidence a witness is speaking to the work done by the "Kalu" when she got into position on this present reclamation. He used the phrase "when she got into position" because she had to dredge herself a flotation. "When she got into position she was pumping 22,000 cubic yards per week for the last ten weeks over more than two-thirds of the output of the season. (Q.) But how many hours a day?—(A.) The actual pumping hours would be about 12 hours. It is 406 cubic yards an hour." That, again, is a very disappointing output, is it not?

A.—Extraordinarily so.

Q.—And a very expensive one?

A.—Quite.

Q.—Except for your belief that in 1912 the "Jinga" was doing good work, you have had no actual practical experience in the working of a rotary cutter suction dredger?

A.—No.

Q.—Now suppose, when you started to write your report, you had been in possession of the figures of the work done by the "Kalu" and the "Jinga" in 1909, 1910 and 1911, do you think you would have recommended a rotary cutter suction dredger for this reclamation?

A.—I was in possession of these very figures, and I still recommended it.

Q.—Let us look at those figures for a moment.

A.—The figures I have, of course, naturally do not agree very closely; although they do approximately, with those you have read to me; but substantially the result is the same. May I show them to you? (*Handing in figures.*)

Sir Frederick Hopkinson.—They are probably from the same source.

A.—Yes, they are signed by the late Mr. Messent, Chief Engineer, who gave me this information personally for my guidance.

Q.—They are the actual figures?

A.—You will see that I got possession of that paper from Mr. Messent in the month of August, 1912, at about the time I was engaged actually in writing my report.

Chairman.—We know now that from the figures before you the "Jinga" was giving about 30 per cent of her guaranteed output, and the "Kalu" less than 50 per cent.?

A.—Yes, both of these being in soft mud; but you are aware that I was in possession of figures applicable to blue clay from other parts of the world.

Q.—Your belief was—and a belief backed up by the fact that when the "Jinga" got into clay she did relatively well, that a dredger operating in the harbour on a mixture of mud and blue clay would give a satisfactory result?

A.—Yes, it would, in my view.

Q.—Were you shaken at all by the figures of the "Kalu" and the "Jinga"?

A.—Not in the very least. Perhaps I had better give the reason why.

Q.—Please do.

A.—I was familiar with both of these boats, and had a very low opinion of the efficiency of their machinery.

Q.—You refer in your report to the superiority of Canadian and American rotary cutter?

A.—Yes.*

Q.—Again I ask you, had you any personal knowledge of them?

A.—Not personal knowledge, but that opinion was founded upon technical papers which had been sent to me by a Canadian engineer.

Q.—Do you know if the cutter used both on the "Jinga" and on the "Kalu" was the patented design of a Canadian?

A.—If it was not the actual patent of Mr. Robinson it was a very close copy. I am not able to say which.

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* Mr. Kidd notes that he refers to American cutter pump dredgers as a whole.

Q.—Of course, as regards the cutter of the " Sir George Lloyd " you cannot speak?
A.—No.

Q.—I think we may take it that the cutter of which we shall hear in the course of to-day—the cutter affixed to the " Sir George Lloyd "—is indeed the invention of a Canadian, and has Mr. Robinson's name stamped upon it. In your report on page 2 you say in the second line of paragraph 6 " A system of boring by hydraulic tubes was devised which proved to be perfectly reliable as well as rapid in action." Had you, before you commenced to explore the bed of the harbour, ever taking borings on a considerable scale?

A.—Yes.

Q.—When and where?

A.—It was my custom, in connection with all the contracts in which I was interested, to take borings for my own guidance over the site of the work, so as to make out my working programme. For example, I may quote Hong Kong as a case in point. At the Naval Docks there was very considerable doubt about the nature of the material we were to dredge there, according to the data supplied by the authorities.

Q.—Who were they?

A.—The Admiralty engineers, and before we selected a dredger we made a system of borings—not so many as in this case but fairly complete—in order that we might know what work the dredger had to do.

Q.—Was that done with a core drill?

A.—It was done with the ordinary old-fashioned drill working inside a tube; but there we had reason to anticipate, upon the information before us, much harder material.

Q.—Where had you done, over any extended area, wash borings?

A.—Nowhere, except in this instance.

Q.—The very fair way, if I may say so, in which you put the matter on page 2, paragraph 6, does indicate that it was at first something in the nature of an experiment.

A.—Well, it is a system which I believe is very much better understood in America, and much more widely adopted there, than it is in this country. The suggestion arose in this case from my having read of a system of borings taken in America by a similar process.

Q.—You therefore sent out a man as Chief Engineer, was he?

A.—Surveyor.

Q.—And two ex-non-commissioned officers of the Engineers and gave them instructions to obtain certain pipes and prepare a certain apparatus?

A.—Quite so.

Q.—And you followed, I think, by the next boat?

A.—Yes.

Q.—You told us you were present on very many occasions when the borings, which are recorded on this map, No. 308, were taken?

A.—Yes.

Q.—You would be on one or other of the two floating rafts?

A.—Yes.

Q.—What pressure per square inch do you think was given by the semi-rotary pump which you employed on the works?

A.—I had a pressure gauge fixed to the pump, and by frequent observations in the deeper borings I found we had reached up to a pressure in the neighbourhood of 100 lbs. per square inch.

Q.—Was it a Wilcox pump?

A.—I do not remember the name, but it was one of those circular diaphragm pumps, with a handle which works in the sector of a circle.

Q.—Was this the kind of thing? (*Showing catalogue of Messrs. W. H. Wilcox & Co., Ltd.'s quadruple acting Wilcox semi-rotary wing pump.*)

A.—That is exactly the pump.

Q.—I am told that, according to the makers' own description, you will not get more than 34 lbs. to the square inch from a pump of that character?

A.—I can only repeat the fact that we attached an ordinary pressure gauge to the pump, and that we did occasionally rise to pressures of, I think, nearly 100 lbs. I do not remember that we ever went over that, but nearly up to it, in the case of the deeper borings.

Q.—Will you just give us a description. Let us assume you are on the raft which is moored in any position you like over any one of these borings. Will you give us a description of what happens?. Take it from the moment when the men have moved away from one boring and have got to the site of another, have fixed their positions, and are just beginning to work. What is done then?

A.—The first thing is to take the tubes, of which I have brought a specimen with me here to-day. As a rule they are in lengths of about 12 feet.

Q.—The internal diameter is two inches?

A.—Yes, two inches.

Q.—And the external diameter roughly 2½ inches?

A.—The external diameter measured over these sockets is probably 2½ inches. We can test that presently.

Sir Frederick Hopkinson.—It is a little over 2½ inches?

A.—Yes, a little over 2½ inches probably. Then we take enough of these lengths, beginning with *this* cutting point.

Chairman.—At the end of one two-inch pipe there is a reducing socket?

A.—A reducing socket is attached, as you see *here*.

Q.—Is this actually one of the things which were used?

A.—No.

Q.—This is merely provided by way of illustration?

A.—Precisely—probably made by the same factory.

Q.—At the end of the lowest tube of all comes your reducing socket?

A.—Yes.

Q.—The object of that is to give an increased pressure to the water as it comes out, is it?

A.—No—merely to provide a cutting point.

Q.—Will you now carry on the process from the moment when that is put over the side and the others are screwed up?

A.—The lengths of pipe are screwed upon *this* in succession, until the pipe rests upon the mud.

Q.—When it touches the mud does it penetrate at all of its own weight?

A.—Its own weight will sink it into the mud.

Q.—At what distance?

A.—To probably a distance of six feet, gradually stiffening.

Q.—Yesterday Mr. Knight told us there was a good deal of variation as regards the consistency of the mud and clay. Is that right?

A.—Of the mud and the clay in proportion to the depth. In both cases, as you get deeper down, the material becomes stiffer, whether mud or blue clay.

Q.—Then, you say, it sinks first of all by its own weight to the extent of some six feet into the mud?

A.—Yes.

Q.—Up to that moment there has been no pumping of water?

A.—No pumping at all, until the blue clay is entered.

Q.—The pumping begins as soon as you feel the resistance of the blue clay?

A.—Quite so.

Q.—I will take this shortly, Mr. Kidd. You have stated in your report emphatically—and these figures are produced—that in every instance you got down either to 70 feet below low water level or on to moorum or hard rock?

A.—I do.

Q.—And that invariably you cut through the clay to at least a distance of 70 feet, if there was 70 feet of clay?

A.—If there was 70 feet, yes. As a rule there was much less than 70 feet of clay, because you have sometimes, it may be, 20 feet of water to begin with out of the 70 feet, and then you may have in certain cases probably 15 feet of mud. I am speaking from recollection of many years ago. So that that would leave only 35 feet of blue clay.

Q.—Still, 35 feet of blue clay and 15 feet of mud would be a very excellent face for a dredger of the type of the "Sir George Lloyd"?

A.—Certainly. That would be very favourable for a dredger.

Q.—Was there a gradually increased resistance as the pipes sunk deeper into the clay?

A.—No. The gradation was more marked in the case of the mud than in that of the blue clay. The blue clay did not materially stiffen between its upper six feet and its lower six feet. The mud perceptibly stiffened in the last six feet of a 15-feet depth. Blue clay is more uniform throughout its depth.

Q.—You say the blue clay had a practically uniform resistance throughout its depth?

A.—That is what I would infer, because although we did meet with more resistance the deeper we got down in pushing this pipe into the blue clay, I should attribute that not to the clay itself being harder but to the greater depth of pipe which was immersed in the clay.

Q.—What is called skin friction?

A.—Yes, skin friction.

Q.—On page 27 of the statement which you have been good enough to give us, you say, " It will be understood from the description of the boring apparatus and power employed that it was incapable of penetrating any hard material, or any material that was too hard for efficient cutter pump dredging "?

A.—Yes.

Q.—If there was all this material of the character set out in this map 308, can you explain why the " Sir George Lloyd " gave its very unsatisfactory output?

A.—I have been considering that question very closely, and I see that not only has the output been given at a very low figure—I think one-quarter of the estimated figure——

Q.—Shall we get the figures exactly right? The number of pumping hours which Sir George Buchanan estimated could be done by the " Sir George Lloyd " was 2,550 (page 3 of Sir Lawless Hepper's report). In 1923-24—that is from the 8th December, 1923, to the beginning of the monsoon of 1924—she worked 843 hours, which, as you see, is a third of the estimated 170 days' working. Instead of dredging 2,000 cubic yards per hour she dredged 1,020, which may be said to be 50 per cent. In 1924-25 she increased her pumping hours to 1,473, but instead of dredging 2,000 cubic yards per hour, she dredged 856 only. In 1925-26 she dredged 959, so that you get 50 per cent. for 1923-24, about 42 per cent. for 1924-25, and just under 50 per cent. for the years 1925-26. Whatever be the cause, the result is lamentable, is it not?

A.—It is indeed.

Q.—Are you in a position to help us at all as to the reason why this vessel did not dredge 2,000 cubic yards per pumping hour, if there was in the harbour the material set out in map 308?

A.—Naturally, I have been thinking about this point a good deal, and if I may read you a statement which I have here, I think it will deal with the matter. I understand that several witnesses, all of whom have been concerned in the working of the dredger, appear to have stated that the material has been of an unsuitable character for the dredger. These statements appear to be based in common upon the unsatisfactory output of the dredger. That, however, appears to me to be putting the cart before the horse. The unsatisfactory output of the dredger may prove the unsuitability of the dredger for the material. It cannot prove that the material is unsuitable for an efficient dredger. If any dredger already in existence is put to work in any given material, and the results prove to be unsatisfactory, the dredger is pronounced to be unsuitable for that particular material, and the remedy is to substitute a suitable one; but, in the present case, the dredger was specially built to do this work. The harbour was deemed the only source of material available that rendered the project feasible, and that source had been accepted by the designer of the dredger. It therefore followed that the design should have been based upon the actual material to be dredged. The exact character of that material should have received particular examination by means, not merely of the borings, but by an actual dredging trial.

Q.—Do you mean an actual dredging trial with a bucket dredger, or something of that character?

A.—A bucket dredger would have done perfectly well, and would have shown the designer himself exactly what material he was going to deal with.

Q.—Interrupting you for a moment, your point is that you are of opinion that no specification should have been sent to any dredger designer unless it had been accompanied by specimens of the actual material existent? Is that it?

A.—No. Specimens are no good in a matter of this kind, because the material alters its character from the moment it is brought out of the bottom of the harbour into the air. It immediately proceeds to harden and to dry.

Chairman.—This is a piece of the clay taken from one of the blocks whilst we were there.

Sir Frederick Hopkinson.—Feel its weight

Chairman.—It is extraordinarily stiff and extraordinarily heavy, is it not?

A.—Yes, it is.

Q.—What we want to know is this. Naturally, if specimens of clay were dredged from various portions of the harbour, and were sent to Messrs. Simons, they would arrive in a hard, dry condition?

A.—Like *this*.

Q.—But could they not be sent surrounded with seawater?

A.—Actually what I think is that, in all the circumstances, the right thing to have done would have been for Messrs. Simons to have gone out to Bombay with the designer

of the dredger, to have borrowed for a week or, if you like, a month, one of the Port Trust dredgers, and to have tried this material at any point of the area shown on *this* drawing, so that they would have had in their minds the knowledge which I had in my own mind during the course of my dredging operations at the Marine Dockyard.

Q.—That, of course, would have caused considerable delay?

A.—The delay was immaterial in view of the importance of the question.

Q.—You say that whatever the delay that would have been caused, it would have been more than counterbalanced by the advantage which would have been gained?

A.—Many times.

Q.—I would still like to come back to this other question. Assume that six or eight samples of clay were taken from various portions of the harbour and put into four-gallon tins surrounded with seawater, would they not have arrived at Messrs. Simons in approximately the same condition as they were when they were dredged from the sea?

A.— Not necessarily so.

Q.—There would be a certain expansion, would there?

A.—It rather depends upon the nature of the material. There are some materials —they all pass under the name of clay; but sometimes a piece of clay, however hard it may be, put into a bucket of water will fall to pieces. There are other clays which will remain intact for a hundred years.

Sir Frederick Hopkinson.—This is not a clay which will fall to pieces?

A.—I think not. My impression of this clay is that it would maintain itself intact in water.

Q.—I know the material of which you are speaking, but *this* is not that material?

A.—Quite so.

Chairman.—Therefore, do you agree that material could have been dredged from the harbour transported in four or six-gallon tins, and delivered at Messrs. Simons in much the same condition as it was on the day it was dredged?

A.—Certainly.

Q.—Would that have been, in your view, a useful indication to the builder of the dredger?

A.—It would have been a very useful indication, but I should much have preferred the course I have suggested.

Q.—When we visited the reclamation site and handled some of the wet clay, the impression we got was that it was of a sticky character. Was that what you meant by the use of the word " unctuous "?

A.—Exactly so. The expression I have used about the clay is " stiff and unctuous." I had the curiosity the other day, although I did not at the time, to turn up a good dictionary to see the definition of both those words, and I found that one definition of the word " stiff " was " not easily worked, tough," and I found a second definition to be " presenting difficulty." With regard to the word " unctuous " I found there were two definitions also which seemed to be applicable. One was " greasy, oily," and the second was " being greasy or soapy to the touch."

Q.—It so happens that I have the same definition in front of me here. That is exactly why I asked you the question—whether by " unctuous " you meant " sticky "? Now, " sticky " and " soapy " are two quite different things, are they not?

A.—Yes.

Q.—You see the point I am on. If you have got a soapy, slippery material, you are going to have less resistance in your pumping operations?

A.—Precisely.

Q.—If you have got what I understood you to mean by the word " unctuous " when we handled the clay—a sticky substance—you are going to get more resistance in your pipe, are you not? It is going to ball up.

A.—If it were sticky that would be so. It never struck me as being sticky in that sense.

Q.—But did not you tell me two minutes ago that, by the word " unctuous " you did mean sticky?

A.—No, surely not? I made a mistake if I did. I have given the dictionary definition of unctuous as " being greasy and oily," and secondly " being greasy or soapy to the touch."

Q.—But, before you gave that definition, my recollection is, which we will confirm in a moment, that I asked you carefully whether by " unctuous " you meant " sticky "?

A.—Then I am afraid I gave you a wrong answer.

Chairman.—Perhaps the shorthand writer will read the passage in question.

Shorthand Writer.—" (Q.)—When we visited the reclamation site and handled some of the wet clay, the impression we got was that it was of a sticky character. Was that what you meant by the use of the word ' unctuous '? (A.) Exactly so."

Witness.—That was a mistake on my part. I had not taken your meaning clearly.

Chairman.—In your report——?

A.—Excuse me, I had not quite finished my written statement. You asked me if I could make any remarks which I might think would be helpful to you on this question of the low output?

Q.—Yes, I am sorry I interrupted you. Will you continue?

A.—I had said that it followed that the design should be based upon the actual material, and naturally the design should also be adapted to the distance of transport, and other conditions. That a satisfactory design could have been evolved by such means will, I think, be agreed, seeing that the same material had already been successfully dredged on a practical scale. I refer to Sewri.

Q.—That is your reference to the " Kalu " and the " Jinga," is it?

A.—Yes, at Sewri.

Q.—But that must be qualified now, must it not, by the figures I have given you of the " Kalu " and " Jinga "—1,426 cubic yards the " Jinga," and 903 the " Kalu "?

A.—Yes, qualified, except in this respect—that the best figures of output which I have on my papers apply to the period during which the " Jinga " was working, for the most part, in blue clay. Shall I continue?

Q.—Yes.

A.—It would now appear, therefore, that the unsatisfactory results of the dredging are due either to the design of the dredger being inadequate, or that the dredger was not efficiently worked, or possibly to a combination of those two causes. I have no data, either as to the design or the working of the dredger, to enable me to form any opinion, and I am not in any case called upon for one, I understand. I do, however, think that the unsatisfactory results of the working of the dredger do not in the least prove that the material is unsatisfactory. On the other hand, the results obtained in the actual dredging operations at the Marine Dockyard were that the bucket-dredger " Kuphus " of moderate power dredged blue clay at the rate of 550 cubic yards per hour, and the " Jinga "—a cutter pump dredger of but moderate efficiency—dredged and discharged the same material through 4,365 feet of pipe at the rate of 1,480 cubic yards per hour.

Q.—Where do you get that? You have taken the best figure of her performances. Is that right?

A.—No. I have taken the figure for the period during which, to my knowledge, she was dredging blue clay for the first time. 1,480 cubic yards per hour.

Sir Frederick Hopkinson.—We make it 1,426—the completed figures.

Chairman.—Therefore, your best figure of the " Jinga's " performance is 25 per cent. below her guaranteed output?

A.—Quite so, but my point for the moment is that her best figure of output was during the period in which she was working in blue clay. And here I think I must tell you of an incident within my own experience. The late Mr. Messent was a very old friend of mine. We consulted together very frequently about our respective affairs. He consulted me about this time as to the idea of dredging the blue clay underlying the mud. When I say " consulted " me, I mean as ordinary personal friends we discussed the matter at dinner one evening. He told me that his dredging men were opposed to the idea of putting the dredger at the blue clay, and that he had never, up to that point, succeeded in getting them to do it; they were afraid of a breakdown. I advised him to press the point, and to make the experiment, which he did, and the experiment resulted in the figure I have just given. Several times during the course of that experiment I went on board the dredger with Mr. Messent to see the operation being carried out.

Q.—Did the " Kalu " work in clay at all?

A.—The " Kalu " was working in clay during this period.

Q.—Did she ever do 50 per cent.?

A.—I beg your pardon, not the " Kalu "—that I do not know. The " Jinga " I am speaking of.

Q.—You were speaking of the " Jinga," and then I asked you whether the " Kalu " ever worked in clay?

A.—I should think it very likely, but I do not know.

Q.—Does that conclude your note?

A.—Yes. I have a further note about some American data that were sent to me. That is at your service if it is wanted.

Q.—With regard to the sea wall, in your report you specify for a certain design of sea wall. It was to be a rubble stone embankment protected with 25-ton concrete blocks thrown pell mell?

A.—Yes.

Q.—And to have a coping of concrete upon it?

A.—Yes; for only a part of the distance.

Q.—The sea wall would perform two functions, would it not? First of all, it would make an enclosed lagoon.

A.—I regarded it as merely to protect the reclamation. Temporarily, of course, it would form a lagoon.

Q.—It was an obvious necessity as regards the reclamation itself?

A.—Surely.

Q.—If you are going to dredge material and pump it into an area that you propose to reclaim, you must shut that area in somehow or other?

A.—Surely. You have, moreover, to protect the reclamation permanently from the attack of the sea.

Q.—That is the other object?

A.—Yes.

Q.—Did you, in your design for a sea wall, contemplate that any serious proportion of the reclaimed material would percolate through it and escape into the open sea?

A.—Not for a moment.

Q.—You state in your report that you feel entirely satisfied of the sufficiency of your proposed design of the sea wall. Was the ability of your sea wall to retain that which was pumped into it amongst the matters on which you felt satisfied?

A.—Yes.

Q.—In your specification, at page 9, you provide moorum in backing to sea walls?

A.—Quite so.

Q.—That is, moorum was to be used to seal the sea wall as a backing?

A.—No; I would not say that. With regard to the greater part of the sea wall, according to my idea, it was a solid and complete structure for more than three-quarters of its entire length. The remaining quarter, intended to be rubble embankment protected by concrete blocks, would naturally have been composed of heavy rough material upon the sea slope, the finer material to form a core to provide for the possibility of the material passing through from the interior. But nothing would have contributed so much to prevent any escape of the material from the reclamation into the sea by means of the rubble wall than the use of blue clay.

Q.—But surely the sea wall must be designed of such a character that whatever material you are pumping into the reclaimed area must be retained by it?

A.—Surely.

Q.—If it is worth while pumping it in it is worth while retaining it?

A.—It must naturally be so.

Q.—At page 9 of your report you estimated in 1912 that for 325·23 lakhs you could reclaim the 1,145 acres?

A.—Yes.

Q.—That is, for about £2,400,000?

A.—I think it is rather less—it is £2,170,000.

Q.—I am now taking the rupee at the rate of 1*s* 6*d*.

A.—Yes; but, of course, in 1912 I was working on 15 rupees to the £.

Q.—I am treating a lakh of rupees as £7,500.

A.—Yes. At this time, as you are aware, 15 rupees to the £ was the standard exchange, and a lakh was £6,666.

Q.—Was that, in your opinion, a safe estimate of cost?

A.—That is what I intended it to be.

Q.—That is what you estimated it to be?

A.—Yes.

Q.—I am using your own words. In order to get safety did you add 20 per cent. to what you describe as the already high rate of labour?

A.—I did. You will find the schedule of wages there, page 11, Report of 1912.

Q.—And 20 per cent. on the estimated cost of materials and plant?

A.—I believe so.

Q.—We have the figures here, but in 1919 am I right in thinking that prices had gone up three times as compared with 1912 prices?

A.—In 1919 I was not in Bombay, but in 1920—in the cold weather of 1920-21—I was there, and the figure that I arrived at after careful study of an estimate I was engaged upon, was 2½ times the pre-war rate.

Q.—That is even in 1921?

A.—In 1921—the spring of 1921.

Q.—When I was asking you about the prices of 1919 as compared with 1912, I meant, for instance, such things as the ordering of a dredger in 1919 as opposed to the ordering of a dredger in 1912.

A.—I was thinking in the answer I have just given you of 2½ times the Bombay local expenditure only. I doubt if that would apply to the cost of a dredging machine which would probably be higher in 1921—more than 2½ times pre-war prices.

Q.—Are you aware that Sir George Buchanan estimated that he could do the work for 367·61 lakhs in the year 1919?

A.—I was informed of that very astonishing statement during my visit to Bombay in 1921.

Q.—If yours was a reasonably close and careful estimate in 1912, your figure in 1919 would be in the neighbourhood of 700 lakhs or more, would it not?

A.—Two and a-half times would be 812 lakhs.

Q.—It would be eight crores.

A.—Eight crores. My informant, I may tell you at this point, regarding the amount of Sir George Buchanan's estimate——

Q.—We have got that on record, so there is no question about it.

A.—That is not my point.

Q.—Do not tell us anything that your informant told you because we shall get a little wide of the enquiry.

A.—Very well.

Q.—We are just content to take that fact without carrying it any further for the moment. You speak in your report of your proposed use of American steel shovels for moorum?

A.—Yes.

Q.—The use of those would depend upon the face of the particular hill that you were excavating?

A.—Precisely.

Q.—Had you yourself any personal knowledge of any place in the neighbourhood of Bombay were moorum could have been obtained by the use of American steel shovels?

A.—I think I have indicated the place here. Paragraph 30 of the report states that: "A royalty has been provided for the removal of moorum from lands at Trombay by a wayleave for a proposed branch railway."

Q.—I am asking you this question for this reason. If you have any local knowledge of a definite character that moorum can be obtained at any particular place in the vicinity of Bombay and in such a quantity that it can be dealt with by steam shovels, we shall be very glad to have that information?

A.—I would be very glad to give you any information I can.

Q.—You say here Trombay?

A.—Yes. One reason why I selected this place was that in connection with the previous scheme for reclamation at Sewri it had been my duty to make a tender for the work at Sewri, and in making out my estimate this question of moorum supply was a very important one. I made considerable exploration of likely sources in order to arrive at the best which was in this neighbourhood, and there I put down a considerable number of borings and trial pits with a view to settling whether moorum or loose material was there, or whether we should get down to hard rock, and I got more favourable indications in this neighbourhood of Trombay than anywhere else I explored.

Chairman.—We are very much obliged to you.

Sir M. Visvesvaraya.—What was the result of your investigation into this question of the supply of moorum or soil available?

A.—I found that I could get the quantity required—the figure I forget now—but a substantial proportion probably for what was required in the present case—at Trombay and its neighbourhood without encountering very much of what I call rocky moorum.

Q.—How many miles is that place from the present reclamation site?

A.—The Sewri reclamation?

Q.—No, the Colaba reclamation?

A.—The intention here—it is mentioned somewhere in this report—was to make a branch railway from Trombay to the nearest station, which was just outside Bombay Island. I think the names were mentioned, and I have an impression they are there,

but it is the station immediately off Bombay Island. There would have been a branch railway of probably five miles or thereabouts to this hill Trombay that I have referred to.

Q.—You had to construct a new line of railway about five miles long before you got into touch with it?

A.—Five miles or thereabouts. I do not know if you have a map, but I would like to point out the place on it.

Q.—From what station would you take your branch line?

A.—That is just what I want to verify on the map.

Chairman.—Anyhow, it is the nearest station?

A.—The nearest station. These events are 14 years old in my memory.

Sir Frederick Hopkinson.—The names of the stations are Matunga and Kurla. It is paragraph 14. You deal with the possible connection with both the railways, and you say you had negotiations with the Railway Companies and you based your estimate on a site on the north end of Trombay Hill?

A.—Yes.

Q.—" Where the western slopes of the hill are formed by extensive talus of suitable material "?

A.—Yes.

Sir M. Visvesvaraya.—That would probably be within 10 miles of our site?

A.—Approximately.

Q.—So you have abundant material within 10 miles of the reclamation site?

A.—Quite so.

Sir M. Visvesvaraya.—That is an important point for us.

Sir Frederick Hopkinson.—Do not forget that that is only for the quantity required under his estimate, not the quantity to finish the whole of the reclamation.

A.—It is for the quantity indicated (2,600,815 cubic yards).

Sir M. Visvesvaraya.—There are other quarries.

Sir Frederick Hopkinson.—That is only as far as he goes.

A.—You must check my mileage figure on your map.

Sir M. Visvesvaraya.—The original project of 1865, you state, was based on moorum, earth and dry filling?

A.—So I was informed.

Q.—The difficulties of transport seem to have led to the abandonment of that project, as you have remarked?

A.—Well, about 1865, as I understand, a little reclamation was actually done and the material was brought from Malabar Hill and Cumballa Hill; but that was no longer feasible in 1912.

Q.—At what rate did you expect to obtain material from Trombay in those days? Can you recollect, roughly?

A.—I should need to derive the figure from the timetable and the quantity here, but the total quantity of moorum provided for here was only 2,600,000 yards, so that it was a bagatelle.

Q.—It was about one-tenth of what we wanted?

A.—Yes.

Q.—Can you tell us roughly what the rate was in those days?

A.—I think it is in my mind that two trains a day were contemplated by the Railway Company.

Q.—And the cost?

A.—My figure is one rupee, 12 annas per cubic yard.

Q.—In paragraph 8 of the statement you have supplied to us you say: " These considerations, particularly those of the sea conditions, lead to the conclusion that if the requisite material could be obtained from the harbour there would be no question as to its being preferable."

A.—That was my view.

Q.—Dredged filling was preferable to dry filling?

A.—Dredging in an exposed sea way is one of the most difficult, expensive and uncertain operations imaginable in engineering.

Q.—So you wanted it from the harbour, not from the open sea?

A.—Other things being equal, as between the harbour and the open sea, I prefer the harbour.

Q.—The total quantity we want for this project is about 28 million cubic yards?

A.—Yes.

Q.—At 1 rupee, 12 annas a cubic yard, which is the figure you have mentioned, the cost would roughly be what?

A.—But it would be a very different figure to-day.

Q.—I quite see that. The cost would be 490 lakhs?

A.—I take your figure.

Q.—You should remember the transport facilities have improved since?

A.—Yes; they have electrified the railway.

Q.—We have made enquiries and we find that it is possible to get moorum at 1 rupee, 4 annas, or less?

A.—Delivered to the site?

Q.—Yes. Actually they are getting it for 1 rupee 9 annas in small quantities?

A.—Yes.

Q.—Without any proper organisation?

A.—Yes.

Q.—With an efficient organisation, and with a proper understanding with the railway authorities we may be able to get it for 1 rupee, 4 annas?

A.—Yes.

Q.—If you get it for 1 rupee, 4 annas the cost will be 350 lakhs for 28 million cubic yards?

A.—Yes.

Q.—Now your project was 325 lakhs?

A.—Yes.

Q.—And Sir George Buchanan's project was 367 lakhs?

A.—Yes.

Q.—Those two projects were quite satisfactory as dredging propositions, but would you have thought it worth while to risk dredging if the cost went up to 702 lakhs?

A.—Not if the cost went up in ratio to nearly three times the original estimate.

Q.—So what was a sound proposition at 367 lakhs of rupees ceased to be such when the project went up to 702 crores?

A.—No doubt.

Q.—Since by dry filling the work could have been done cheaper?

A.—Quite so; but it occurs to me to say, lest I be thought to agree that the substistitution of moorum filling for pump dredging is a sound way, that everything depends upon the efficiency of your dredging machine. I still say that I am perfectly convinced that the reclamation can be filled up more cheaply to-day by means of an efficient pump dredger properly worked than it can be by any other method; and nothing has happened to persuade me that that is not so.

Q.—The distance to be pumped is rather considerable, is it not? The distance to which the pumping has to be done is rather considerable in this case?

A.—It is the same now as in 1912.

Q.—You went into all the calculations then?

A.—I provided for 12,000 feet of transport in addition to a gravitation fall at the end of 12,000 feet for the remote corners of the work.

Q.—Were your calculations based on the actual working of any similar plant abroad?

A.—Well, I had very complete data as to the cost of working dredgers in America. Mark you, no other data applicable to this business were available at that time inasmuch as no English engineer, as far as I am aware, had ever carried out a reclamation scheme upon the principle of pump dredging. But on the other hand, many schemes of that sort had already been concluded in America and in Canada.

Q.—In Canada particularly?

A.—Yes.

Mr. Billimoria.—Of this magnitude?

A.—Well, particulars of one case sent to me, which was of land reclaimed in front of Chicago in the lake, was to an extent of some 700 to 800 acres, if my memory serves me aright.

Sir M. Visvesvaraya.—You stated that steam shovels can be used for moorum—for digging in moorum?

A.—Yes.

Q.—Have you done that anywhere? Have you actually used them?

A.—I had no occasion to in my contract at Bombay.

Q.—Is not moorum a very hard material to deal with with steam shovels?

A.—As you probably are aware, you may have moorum in all degrees of hardness—from quite loose earth up to very hard rock. It is all a question of the amount, of its decomposition, and of how near the surface it may be.

Q.—As you go deeper it becomes harder generally?

A.—Yes, generally, the further you go into the mountain. After all, moorum is nothing more or less than decomposed basalt rock, and its hardness or otherwise depends on how far the decomposition has proceeded.

Q.—The steam shovels were dealing very satisfactorily in the Sukkur Barrage with the material?

A.—That is loose material.

Q.—Steam shovels are not often used for digging in moorum?

A.—It depends. The trials which I made in Bombay in connection with the Sewri Reclamation showed a material which was eminently suitable for steam shovels.

Q.—Moorum?

A.—Yes.

Q.—You have had experience of that?

A.—In the trials at Bombay by borings and open pits there was no question about the material exposed in those pits being suitable for steam shovel work.

Q.—You have seen that clay is described as soft clay for the purposes of the dredger design?

A.—By whom?

Q.—By Sir George Buchanan.

A.—I can only place against that my own description, stiff and unctuous.

Q.—So it was not quite correct to say that it was soft clay?

A.—Not at all correct.

Sir Frederick Hopkinson—In his report in 1919 he calls it hard clay.

Sir M. Visvesvaraya.—Yes, but in the specification and in the same report you will notice he describes it for the manufacturers as soft clay?

A.—Then that is probably the root of a good deal of your trouble.

Q.—That is my point. A good deal of the trouble is due to the incorrect description of the clay?

A.—Quite so.

Q.—You agree on that point?

A.—Well, I do not know. I have to accept what you say. I merely say that I should never have described it and never have described it as soft clay.

Q.—You are prepared to help us with your advice on these technical points?

A.—Most emphatically.

Q.—You would have no objection to calling it hard clay?

A.—I would not go quite so far as that, not for the most part.

Q.—You would not call it hard clay?

A.—No.

Sir Frederick Hopkinson.—Would you for that bit? (*Pointing to sample.*)

A.—Yes, I dare say I would in its present condition, but I would like to see it in its original condition.

Sir M. Visvesvaraya.—It does not represent the clay in its natural condition?

A.—No.

Q.—It is taken from the reclamation area and sent up here?

A.—Yes.

Q.—Another important point which has arisen in connection with this Inquiry is whether it was a wise thing to arrange for tests on the Clyde and not on the site. Some tests of a perfunctory character, if I may say so, were carried out on the Clyde, and then the plant was sent out 5,000 miles. There it was put to work and did not do its duty?

A.—I have had a little experience of tests on the Clyde, and do not attach very much value to them.

Q.—We have had that opinion from other engineers also?

A.—Yes. The conditions on the Clyde are very favourable to exceptionally high results.

Q.—You know people have said so?

A.—Yes.

Sir Frederick Hopkinson.—Perhaps that is why the Clyde was selected.

Sir M. Visvesvaraya.—What would you have done, supposing you were the principal or purchaser in this case, in order to ensure that a good dredger was delivered to the site? What is the usual practice?

Chairman.—Is there any usual practice?

A.—I believe the usual practice is to go to the dredger builder and order the dredger.

Sir M. Visvesvaraya.—That seems easy enough, but what is the next step. How do you make the dredger work successfully?

A.—It was not quite the step to be taken in this case because as has been indicated here the whole conditions were unprecedented. It required very special study and a very special design for any dredger that was going successfully to cope with this work.

Q.—That does not seem to have been done in this case?

A.—I am not aware of what has been done. I have to be informed by you.

Q.—You are aware that in the case of the " Kalu " and the " Jinga " a guarantee was secured from the same builders to give a minimum output per hour?

A.—Yes, which they never did.

Q.—That experience was available?

A.—It was.

Q.—They do not seem to have profited by that experience?

A.—I think there were some very useful lessons in the experience of the Sewri Reclamation to be derived, which were applicable to this case.

Q.—Another point about which I want your opinion is this. The engineers have calculated that working 170 days at the rate of 2,000 cubic yards per hour for 15 hours a day you can get 5,000,000 cubic yards per season?

A.—Yes.

Q.—Is that a correct calculation from your experience? It is arrived at in this way. Fifteen times 2,000 means 30,000, and multiplied by 170 is 5,100,000?

A.—Granted that you had provided a dredger capable of removing 2,000 yards an hour, yes.

Q.—It is feasible?

A.—2,000 yards an hour is not an impossible output for a dredger, but in this case, having regard to the length of the delivery pipe and to all the conditions attaching to it, it certainly would have been the most powerful dredger that had ever been built in the world. That is what I had in contemplation when this report was written—conditions were unprecedented I think I say.

Q.—You have said that the ratio of cut to fill is ten to seven?

A.—The cut to fill is ten to seven; that is, dealing for the most part with blue clay, I should say.

Q.—Where do you get that figure of ten to seven?

A.—I made certain experiments in connection with the Sewri Reclamation when I was estimating for that, which led me to adopt that standard.

Q.—That means really 30 per cent. is lost?

A.—Thirty per cent. is lost, and it is lost mainly in my view in evaporation. You see in the upper portion of the Reclamation, whether it be in Back Bay or at Sewri, above the tide level the clay or mud or whatever it be becomes dried by the sun. In the course of drying it loses no less than over 50 per cent. of its bulk by evaporation.

Sir Frederick Hopkinson.—The clay does?

A.—Not the clay—I beg your pardon, the soft mud, but not the clay. The clay loses very, very little indeed by evaporation.

Sir M. Visvesvaraya.—That is because the material outside is partly water and partly mud?

A.—Yes, clearly.

Sir Frederick Hopkinson.—I have got a tin of mud here, and we will send it round to the testers and have it evaporated and find out exactly what it is.

A.—Except that I might suggest that a tin that has been out of water for some time has probably lost something.

Q.—It is in water now.

A.—It is an experiment I can tell you in a moment about.

Q.—This stuff has about the consistency of treacle?

A.—I can tell you precisely the experiment on which that figure was founded. When I was engaged in working out these estimates for Sewri I had a large iron pan 5 feet square and 2 feet deep filled with mud freshly collected from the harbour. We placed it over a slow fire and in the sun for some time, and by weight the loss was over 50 per cent.

Q.—But what was it in volume?

A.—That I cannot tell you.

Q.—That is the important thing. Weight does not count at all.

A.—My figure is by weight.

Sir M. Visvesvaraya.—Even in the Reclamation area the mud and water may remain permanently in the lower levels?

A.—Yes.

Q.—What is the proportion of pumping time to total working time, normally from your experience?

A.—Barring breakdowns I should put it at between 80 to 90 per cent. in the ordinary case.

Q.—What do you take as the actual material pumped to the total quantity of water and material pumped?

A.—That is a very difficult question or a very material one. In soft mud you will get a very poor performance. That is why in the back of my own mind I invariably preferred blue clay to the mud—that we should get more efficient results and carry a higher percentage of clay in the water than we should by soft mud.

Q.—So that you have no opinion of soft mud?

A.—No.

Sir Frederick Hopkinson.—You are bound to take that 15 feet of mud before you can get to the clay?

A.—Of course you are.

Sir M. Visvesvaraya.—This is a point that has not been answered. Are you in favour of a guarantee for the proper performance of the dredger at site or on the Clyde? You said not on the Clyde. May I take it that it would have been better to have had a guarantee for working on the site?

A.—It would, of course.

Q.—You may be aware it was done in the case of the "Kalu" and "Jinga" by the same makers?

A.—I do not know.

Q.—You may take it from me?

A.—Yes, but I do not know myself.

Q.—If it was done in the case of the "Kalu" and "Jinga" it would have been a wise thing to do the same in the case of the "Sir George Lloyd" and the "Colaba" also?

A.—Yes.

Q.—Did you ever contemplate dredging in Back Bay?

A.—I contemplated it, but I only contemplated it in the eventuality that the material might not be found in the harbour. If it was found in the harbour I would not go to Back Bay.

Q.—Do you consider that there is enough material in Back Bay?

A.—I never investigated that very fully. As soon as I was satisfied that the material was available in sufficient quantity in the harbour we did not pursue the investigations in Back Bay further.

Q.—Do you think that any changes have occurred in the bed of the harbour since the borings were taken in 1912?

A.—It is extremely improbable.

Q.—Do you think that dependence could be placed on the surveys of 1912 in designing in 1919?

A.—Surely.

Q.—You do not think there would be any deposits or erosion of the bed in the interval?

A.—The only thing that might have happened in the interval would be a further accumulation of soft mud. Bombay Harbour is gradually shoaling—becoming shallower.

Q.—You think that good types of dredgers could be built in order to dredge in the blue clay you have described?

A.—I feel sure of it.

Q.—Would you work in two shifts or three shifts?

A.—In three shifts.

Q.—Contractors would not wish to lose time but would work in three shifts?

A.—Certainly three shifts was the basis of my calculations.

Q.—They have not been working in three shifts out there?

A.—I believe not. In all my estimates three shifts were provided for—a continuous 24 hours' work.

Q.—Every contractor does that. Was it right to have started the sea-wall from both ends?

A.—I would not myself have done so.

Q.—You would have cut up the site into small bits by dividing walls?

A.—I intended to start at the *outer* end as a matter of fact to get the shelter of the wall coming round against the prevailing onset of the sea.

Q.—The outer end means the " Colaba " end?

A.—Yes.

Q.—You wanted to start from that end?

A.—To start from that end and work along towards the north.

Q.—Did you make provision for storm water drains?

A.—Yes.

Chairman.—It is in the group under P.W.D. estimates?

A.—Yes, item 5 on page 9.

Mr. Billimoria.—Do you mean that is included in the figure of 59.45?

A.—Yes.

Sir M. Visvesvaraya.—You gave a rate of 9 annas 3 pies pump filling?

A.—Yes.

Q.—That was to include the value of the dredger?

A.—It did.

Q.—Over how many years did you distribute the cost of the dredger, roughly?

A.—Well, the total cost of the dredger was absorbed in the cost of the work so that it was written off. There was a full charge of the first cost of the dredger included in this item.

Q.—Several engineers have deposed that this is not a dredging proposition at all in the circumstances now revealed. What is your opinion on the point?

A.—I never regarded this scheme as being feasible at all except upon the basis of a dredging proposition.

Q.—At what cost do you think this can be regarded now as a feasible financial proposition, now that you know so much about it?

A.—I do not know that my opinion upon that is of any value.

Chairman.—At what date—I do not quite understand your question?

A.—I understand what I am asked is—at what total cost I would have regarded the scheme as a feasible commercial proposition.

Chairman.—In what year?

Sir M. Visvesvaraya.—In 1920?

A.—I cannot say.

Q.—And now at the present date?

A.—I have never looked into that question. It is not an engineering question.

Sir M. Visvesvaraya.—You are a contractor and you also take into consideration the financial aspects of a scheme?

Sir Frederick Hopkinson.—It all depends on what you get for the land?

A.—Quite so.

Chairman.—You were prepared to reclaim a certain area at a certain price in 1912?

A.—Yes.

Q.—What they did with it was not your concern?

A.—Quite so. As a matter of fact it is within my knowledge—I was working in very close co-operation with the Public Works Department in this business—that both in 1910, when the preliminary scheme was put in hand, it was elaborately investigated by Mr. Cameron, who was then the head of the P.W.D., and in 1912, upon my report, is was similarly investigated by his successor, Mr. Kemball.

Sir M. Visvesvaraya.—I have given you the quantity of filling to be 28,000,000 cubic yards?

A.—Yes.

Sir M. Visvesvaraya.—Would you, knowing the rates now, consider the cost of 600 lakhs excessive?

Chairman.— That is for moorum filling?

Sir M. Visvesvaraya.—We want the reclamation, whether done by dredging or by moorum filling, whichever is cheaper?

A.—You mean at a total cost of 800 lakhs do I consider it would be feasible?

Q.—I said at a total cost of 500 or 600 lakhs would you recommend the construction of this reclamation—at a total value of 500 or 600 lakhs?

A.—If it was a good proposition at 325 lakhs in 1912, as I am advised it was, it would be, I think, at double that amount in 1926.

Q.—Was it right that the manufacturer should have accepted a specification of this character, that the dredger could pump about 5,000,000 cubic yards per annum?

A.—If a dredger builder is furnished with certain data by his client I take it that his business is to build a machine which will comply with the requirements and with the descriptions which have been given to him in that statement. I take it if he does that he has fulfilled his responsibility.

Q.—But usually the dredger builder is held responsible for the output. It should do what he has promised it should do?

A.—That is expected, of course.

Sir M. Visvesvaraya.—Can you call upon the builder to put the plant right?

Chairman.—The witness cannot possibly answer that question. That is on the construction of the particular contract.

A.—That is all I can say. It depends upon the terms of your contract with the builders.

Sir M. Visvesvaraya.—I think as a business man we might get it from you.

Chairman.—It depends on the construction of the contract.

A.—I have not seen the contract and I do not know. It is a lawyer's question.

Chairman.—It is a question no witness could answer.

Sir Visvesvaraya.—I do not know whether this question is objectionable or not but I want to put it to you. Cannot the dredger be made to deal with the desired output either by increasing the power of the engines or the design of the cutter?

A.—I am sure that a dredger can be built which will remove this material satisfactorily. I do not know what your present dredger is like or how nearly she may approach to the machine that I am certain can do it.

Q.—When a dredger fails to give the promised output what are the measures usually taken by the purchaser? I am putting to you an elementary question. As a contractor you can tell us the various processes through which you go.

A.—I have never personally got very much satisfaction out of the failure of a builder of a machine to carry out its specified duty.

Q.—You never yourself got any satisfaction?

A.—No doubt there have been cases where with a very rigid specification and a very obvious failure damages could be recovered, but I have never known it done in the case of a dredger.

Sir Frederick Hopkinson.—There is one thing I should like to say to Mr. Kidd for his satisfaction about this description of clay that he has put here. I put the question to the Chief Engineer in Bombay as to whether after his experience and knowledge of this material for over between three or four years he could give me a better description than yours, namely, " stiff and unctuous," and he said he could not.

A.—I am very glad to hear that, Sir Frederick.

(Adjourned for a short time).

Sir Frederick Hopkinson.—You were speaking this morning about having included the storm-water drains in your estimate. There is nothing in your estimate itself which shows that the storm-water drains are included. It only says roads, lighting and drains. I do not think those include the storm-water drains at all?

A.—I must say that that part of the estimate, as is noted here, was prepared for me by the P.W.D. I discussed these points with Mr. Kemball, who was then the Chief Engineer, and he told me that he had people on his staff who were much more familiar with this business than I was, and he said, " We will make this estimate and give you the figure."

Q.—You will see from your own report that the words " storm-water drains " are not included?

A.—No.

Q.—And I suggest to you that " drains " means only those road drains which are ordinarily put in in such a case? The storm-water drains are the continuation of drains already existing across the city of Bombay——.

A.—Which I know.

Q.——which you know, and which are very large?

A.—Yes.

Q.—Some of those drains, I believe, go up to as much as 9 feet in diameter?

A.—My recollection is about that.

Q.—The total cost of those drains was 64 lakhs—£482,000?

A.—Yes.

Q.—That appears to have been omitted by the P.W.D. in giving you the estimate for the drains?

A.—I do not remember that the point was ever discussed.

Q.—We have looked at the P.W.D. details and we cannot find any mention of storm-water drains at all, and they are not included in your estimate. The value of them being 64 lakhs, it comes to more than your total estimate for roads, lighting and drains, so obviously they could not have been included?

A.—It rather would appear so.

Q.—Sir George Buchanan, in making his estimate in 1919, also does not mention the storm-water drains, but he slightly increases the figures which have been given him by the P.W.D. Evidently he had no knowledge whatever of these storm-water drains and did not provide for them in his estimate. Did you send in any plans with your original estimate to the Government—for instance, the section of the embankment wall?

A.—Yes. There was a complete set of drawings which I think are scheduled at the last page of my report.

Sir Frederick Hopkinson.— We have not seen them.

Witness.—On page 22 of this report you will find a list of them, numbering 10 in all.

Sir Frederick Hopkinson.—Have you had them, Mr. Elgee?

Mr. Elgee.—No, I have not seen them.

Sir Frederick Hopkinson.—They are filed away somewhere, clearly.

Witness.—They number 10 in all—the drawings lodged with the report.

Q.—The total cost of the dredging plant supplied for the Back Bay reclamation was about £855,000. Can you give me any idea of the amount included in your estimate for plant?

A.—I think I can. I have carefully kept my original estimate book.

Q.—I want you to include the pipe lines?

A.—Perhaps you would like me to run over the items?

Q.—Yes, if you will. I will put them down if you will call them out?

A.—Pumped filling, plant delivered and erected at Bombay: a dredger of 7,500 horse-power.

Q.—That is two-and-a-half times the horse-power of the dredger sent out there?

A.—Your difficulties are explained! £130,000. Pipe line 11,500 feet, £86,250; shore piping 3,500 feet, £4,375. Add for coupling up and setting the pipes afloat, £7,500; terminal delivery pontoon, £3,000; tug and water boat combined, £7,000. Anchor lighter, £2,500. Two barges for coaling and similar at £3,000, £6,000. Boats, £1,000. An oil launch, £2,000. Telephones to the dredger, £500. Workshop equipment, slipway, £12,500.

Q.—There is no need to have that, because that does not appear in the other estimate?

A.—Sundry further provisions, £10,000, total £272,625.

Q.—That you were going to do with one pump only?

A.—No. There was a "booster" subsequently included. It is called here "Relay pump barge." This is the working cost. I am afraid I cannot lay my finger upon the prime cost for the moment.

Q.—There is no hurry. I would like to get the cost of this booster. Was it a floating booster?

A.—It was a floating simple square barge with a pump and an electric motor on board. That is my recollection. So far as I remember, the cost was put down in my estimate at £15,000. I give you that figure from memory.

Q.—That is almost exactly one-third of the cost of the "Sir George Lloyd" and the "Colaba" and the other pumping appliances?

A.—Do I understand that the "Colaba" was regarded as what I have just called a "booster"?

Q.—A booster only. She was a boat almost identical with the "Sir George Lloyd" dredger, with propelling engines. In fact she was almost an identical ship, except that she had not a ladder. So that if your price in 1912 were multiplied by three for 1919, we should get almost exactly what has been paid for the present pumping plant?

A.—Quite so.

Q.—That points to the fact that three is a correct multiple?

A.—Yes, as I understand it was at that time.

Q.—It is a correct multiple for the difference in cost as between 1912 and 1919. Therefore, in order to get an accurate estimate for the purpose of showing the total cost to the Government in 1919, the cost of the provision of plant should have been three times as much as your estimate of 1912?

A.—Quite so.

Q.—There is one thing to be noticed, and that is that your plant in 1912 gave two-and-a-half times the horse-power of the " Sir George Lloyd "?

A.—Quite so. That is a very important point.

Q.—Therefore the dredging plant in 1919 cost a good deal more than three times your cost?

A.—Yes, power for power.

Q.—There is another thing, too, to be considered, and that is that your booster did not provide for a power supply. You were going to get that from the town?

A.—Yes; from the Tata Company.

Chairman.—There is the matter of the propelling engines.

Sir Frederick Hopkinson.—Propelling engines were unnecessary, as I suggested to Sir John Biles the other day A plain pontoon with a motor was what Mr. Kidd provided, and what he thought would be sufficient.

Witness.—We had a tug boat available to move the pontoon.

Q.—You provided for a tug?

A.—Yes.

Q.—It has been stated in evidence, and shown in detail, that the ordinary working losses of time between the total time the dredger worked and the actual pumping hours was 36 per cent., and there has been a general concensus of opinion amongst all the witnesses whom we have examined that that is not an unreasonable delay. You spoke this morning of getting between 80 and 90 per cent. of working time. That is what you based your figures on?

A.—Yes.

Q.—The Chairman of the Port Trust, who was the engineer, I think, when the Sewri reclamation was done,* gave it as his opinion, from his experience of the " Kalu " and " Jinga," that 36 per cent. was not an unreasonable figure?

A.—I do not agree.

Q.—You think it is too great a delay?

A.—Quite so.

Q.—The general feeling amongst all the witnesses has been that 36 per cent. is not an unreasonable time?

A.—I have been dredging by bucket dredger—I do not see that there is any need for distinguishing between a pump dredger and a bucket dredger—and I know that my working time, on that bucket dredger, was between 80 and 90 per cent.

Q.—They had a lot of trouble in Bombay from the high tides?

A.—Yes, they would do so, working on the outer edge.

Q.—They seemed to have lost a good deal of time on account of the strength of the tides?

A.—I had thought about that and, I think, provided amply for it in the shape of moorings, and especially of the mooring winches which were contemplated in the design of the dredger for which my estimate price was given.

Q.—With regard to the working of the dredger, here was a plant costing the large sum of £855,000, which began work on December 8th, 1923, and worked for the whole of that season on a single shift, that is, something between 8 and 9 hours. Do you think that a reasonable way to work such a plant?

A.—Not at all, more especially having regard to the enormous capital cost involved in that plant.

Q.—That would be the determining factor in making you work, as you said, 24 hours a day?

A.—Yes.

Q.—Do not you think that 99 per cent. of contractors who might be doing such a work as this would also wish to work 24 hours a day?

A.—I should amend your figure and say 100 per cent.

Q.—It would always be the normal thing for a man to do who was going to get the best out of his plant?

A.—Quite so.

Q.—The first season's work was described as experimental. What can you see which is experimental in working a suction dredger at a cost, for interest, of £50,000 or £60,000 a year?

A.—The whole question involved, to my mind, would have been the training of the crew for the working of the vessel, and I should have hoped to have got towards normal efficiency within two months.

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* Mr. Kidd notes that this is incorrect. The Chairman of the Port Trust was not then in Bombay.

Q.—They described it as an experimental season's work. The second year they worked a total of 15 or 16 hours a day, 64 per cent. of which was pumping time. The whole dredging was to be done in five years, which represented an output of 5,000,000 yards a year. Fifteen or 16 hours a day at 64 per cent. efficiency meant a maximum output of a little over 3,000,000 yards a year. Can you tell me how anyone could frame an estimate on a certain number of yards to be done which, according to his own outputs of 3,000,000 a year, taking it at 2,000 yards an hour, could come anywhere near that?

A.—They must have used totally different data in arranging their working programme from those which they employed in their original calculations.

Q.—Do not you think the data they used was simple arithmetic?

A.—Surely.

Q.—There never has been any intention apparently, up to the present time, until we were out there, of working the dredging plant 24 hours a day?

A.—That, of course, is astonishing to me.

Q.—In Sir George Buchanan's original estimate he says, "The plant has been designed to deal with 25,000,000 cubic yards in five years, working 170 days a year and 15 hours actual pumping a day in two shifts." That means, to get 15 hours pumping a day, plus 36 per cent., working 22½ hours a day in two shifts?

A.—Yes, but two shifts would never have been possible—two 12-hour shifts for a 24-hour day's work in Bombay. I provided for three crews.

Q.—You have an extensive experience of work in Bombay; you have been working there for years?

A.—For four years at the time this report was written.

Q.—With that experience you say you would, under no circumstances, have provided for working 24 hours a day with two crews only?

A.—Certainly not.

Q.—You would have had three?

A.—Yes, I would have had three.

Q.—Partly owing to the conditions of the climate?

A.—Partly, and there would have been no stoppage for meals. The ship would not have been stopped, except for some breakdown of machinery or shifting moorings.

Q.—Part of the 36 per cent. stoppages?

A.—Quite so.

Q.—So that under no conceivable circumstances, working 170 days a year and 15 hours pumping time a day, could you get five million yards a year?

A.—Even at the full output, no.

Q.—Unless you were working 24 hours a day?

A.—Quite so.

Q.—But there was no suggestion, up to the time we were in Bombay, that they ever intended to work the dredger more than two shifts, that is, 15 or 16 hours a way?

A.—In that case the original calculations could never have been realised.

Q.—As we know, they have not. I notice in your statement which you gave us yesterday that you estimated the cut to fill in the clay as 10 to 7?

A.—Yes.

Q.—I should be very interested to know where you thought that other 30 per cent. would go?

A.—With regard to the mud as distinct from the blue clay——

Q.—No, keep to clay.

A.—But my figure of 10 to 7 is based upon the combination of the mud and the clay.

Q.—Not on the clay only?

A.—Not on the clay only; and I may say that the loss upon the mud would have been much greater than the loss upon the clay.

Q.—In fact should there be any loss on the clay?

A.—I do not think there should be any loss on the clay.

Q.—It should be rather the other way about—that it would have bulked a little?

A.—I do not think it would have bulked.

Q.—Could you possibly disturb the blue clay, which has been at the bottom of that harbour for centuries, in any possible way without increasing its bulk?

A.—No, temporarily, you could not. If there had been any change at all it would have been in the direction of a slight increase. I want to make it clear that the 10 to 7 ratio was based on the fact that we could not get the blue clay without taking the

mud which overlay it, and there was, of course, a considerably heavier loss than the ratio between 10 and 7 taking mud alone.

Q.—You mean in the work done?

A.—In the work done at Sewri.

Q.—They had a 24½ per cent. loss there.

A.—That is rather less than my ratio. I had not that fact, and I am agreeably surprised that it is so.

Q.—I am not satisfied about this hand pump of yours. You told us you got from 80 to 100 lbs. pressure in that hand pump, and Mr. Knight told us the same thing yesterday. I was troubled about it, and I have since got the makers' catalogue, which gives the maximum pressure of his double acting pump as 70 feet. It says, " It may reach 70 feet." That is about 30 lbs. roughly, is it not?

A.—Yes.

Q.—You know probably better than I do that these makers' figures are rarely, if ever, reached in practical working?

A.—Quite so.

Q.—They take clean water and a new pump, and the valves fit perfectly. Everything is under the best possible conditions, which you do not get in ordinary practice?

A.—Quite so.

Q.—Then, if you turn to the quadruple acting pump, which is a better pump than the other, the maker gives a maximum pressure of 34·6 lbs. per square inch?

A.—Let me tell you exactly what happened. The object of this water pressure, to my mind, was to reduce the skin friction. It had no other purpose whatever.

Q.—It was not for cutting the clay?

A.—Not in the least. Very well, then. The normal pressure which was indicated on the gauge was that which was due to the depth of the water and to nothing else; but now and then when, in the course of operating the pipe, the men practically jammed the mouthpiece into the clay for a minute or two it may be, we would, in blowing out that piece of clay from the mouth of the pipe, run up to the pressure which I have given you, and immediately the plug of clay was blown out of the mouthpiece, the pressure came to normal.

Q.—So that it was not an effective pressure for cutting the clay?

A.—Oh, no. It had nothing to do with it in my mind at all. The object of the water pressure was solely to reduce the skin friction upon the pipe, because obviously 70 feet or rather 35 feet of that pipe stuck in the blue clay would have been jammed for good.

Q.—You want a fair volume of water for that?

A.—Yes.

Q.—It is not pressure but volume which is required to reduce skin friction?

A.—Quite so.

Q.—Therefore I am right in my doubts as to the general efficiency of this pump?

A.—Quite. Still, the fact remains that under those circumstances we did run up for a moment to a high pressure.

Q.—If I had been there I think I should have said, " Take that pressure gauge off and have it tested."

A.—Possibly that might have modified the figure I have given, but we were getting similar results on both barges.

Q.—However, the explanation you give is that it was only a momentary pressure?

A.—Yes, to blow out the clay plug in the mouth of the tube.

Q.—It is clear from Sir George Buchanan's report of September, 1919, that he had been making enquiries into the working of the " Kalu " and the " Jinga." If you look at the bottom paragraph of page 6 you will see he says, " Government are well aware that economy in this class of work can be attained only by securing that the suction dredgers and other plant required shall be of the best design. The difficulties which have arisen with the Port Trust dredgers serve as a warning on this point." So that he was evidently familiar with the failure of the " Jinga " and the " Kalu " to give their estimated output?

A.—Evidently.

Q.—Consequently he, as engineer responsible for the design of the dredger, would take precautions to see that he got something better than either the " Kalu " or the " Jinga " if he wanted to get his 2,000 yards a day?

A.—Evidently.

Q.—Did you ever hear how your tender for the Sewri reclamation compared with the actual cost of the work?

A.—I cannot give you the figures, but I have the impression that our tender was considerably below the actual cost to the Port Trust themselves.

Q.—Because Sir George Buchanan says the exact reverse, and he gives that as a reason for doing the work departmentally. You cannot give me the figure?

A.—I am afraid not. I do not think I have ever had it.

Q. It is unfortunate.

A.—I certainly have not seen the figure of the cost to the Port Trust doing the work departmentally. No doubt somewhere in my possession I have a copy of my own figures for the tender.

Q.—But you do not know of your own knowledge?

A.—Not the cost to the Port Trust.

Q.—I take it that what you said this morning about the ordinary prices in Bombay being two and a-half times as much in 1919 as they were in 1912——?

Chairman.—The witness said 1921.

Witness.—Yes, 1921.

Sir Frederick Hopkinson.—Very well, 1921—that the cost of the dredger would be in a larger ratio than that?—That is my impression.

Q.—Also, would that cover machinery purchased in England—cranes, locomotives, cement mixers and all that sort of thing?

A.—Quite.

Q.—So that do you think we would be far out if we took the fair ratio between 1912 and 1919 as being about three times?

A.—I think you would be a little more than fair. Putting everything together, I think it would be a little less than three.

Q.—We have figures which show us that cement, for instance, in 1919 was three and a-third times as much. Iron bars were two and a-half times as much.

A.—As a very important factor, could you give me the relative price of steam coal?

Q.—Coal was three and three-quarter times as much.

A.—That affects the matter. That leads me to modify the opinion I have just expressed. Instead of saying slightly under three times, I should be inclined to say slightly over, because the quantity of coal used in dredging is, of course, a very big factor in the cost of the working of the plant.

Q.—You think we should not be far out if we took about three times?

A.—I think about three times.

Q.—Therefore your estimate in 1912 of 325 lakhs would be, in 1919, 975 lakhs?

A.—Quite so.

Q.—You will be interested to hear that the latest estimate for finishing the work is a thousand lakhs. You spoke in your original report about a capping of concrete to the reclamation bank. What size was that?

A.—The idea of the capping was that, after the rubble mound had settled and after the random blocks had been put down on the sea side, having gone through perhaps two monsoons we should put a capping, as far as I remember, about three feet thick and twelve feet wide over the entire crown of the mound.

Q.—And a parapet in addition?

A.—No.

Q.—You were not thinking of a road coming close up to the edge of the reclamation?

A.—Yes.

Q.—Would not the waves break over that and flood the road?

A.—Not at this portion of the sea wall.

Q.—I am speaking of the general length of the sea wall.

A.—I am speaking now only of the rubble mound section where a capping of concrete was employed over the rubble.

Q.—Which end is that?

A.—The in-shore end.

Q.—Which do you call the in-shore end?

A.—The marine lines end. The reason why a uniform design of sea wall was not carried through from end to end, on the lines of three-fourths of the length of the outer part, was that the rock disappeared from the surface at that point and went to a considerable depth; and the solid concrete wall, such as was contemplated for the rest of the length, would have been expensive in the matter of foundations in order to get down to a hard foundation. Over the length of the solid concrete sea wall, while no parapet was provided for, there was a very heavy bull-nosed coping provided in *this* fashion. (*Indicating.*)

Q.—In the nature of a parapet?

A.—Yes, in the nature of a parapet. Another important point bearing upon that same thing is that round the curve forming the most exposed part of the wall to the south-west monsoon, the entire height of the sea wall, round the south-west corner, was for a considerable length raised ten feet about normal height—not only for the wall itself but for the whole of the roadway of 150 feet wide.

Sir Frederick Hopkinson.—I should like to see those plans. Is it possible for us to get them, Mr. Elgee?

Mr. Elgee.—I do not know where they are.

Q.—The statement has been made many times during the course of our enquiry that the material in the harbour was not suitable for the dredger. That seems an extraordinary way of putting it, does it not?

A.—As I said this morning, it is putting the cart before the horse.

Q.—Was not the proposition this—that the dredger was to dredge certain material from a certain place and put it in another place?

A.—Quite—with a dredger specially built for that purpose.

Q.—Therefore, was it not incumbent upon the people who were designing and building the dredger to make absolutely certain that the dredger was suitable for the material, instead of the material being suitable for the dredger?

A.—You could not make the material suitable for the dredger. You could make the dredger suitable for the material.

Q.—I do not know whether you can throw any light upon this, but the first season's dredging, which was called experimental, seemed to be better in output than the subsequent years, during which time they had gained experience in dredging. Can you throw any light on that?

A.—I cannot at all. I should have expected the reverse result.

Q.—To refer to this experiment of yours in making the borings. You do not suggest, do you, that the water actually cut up the clay?

A.—Not in the least. It had nothing to do with it whatsoever.

Q.—I have been rather puzzled by this, because it has been suggested several times, that the object of this wash boring was to enable you to cut the clay away so that the pipe could descend into it.

A.—That had nothing whatever to do with it. The sole object of the water was to reduce the skin friction up the side of the tube.

Q.—You had no intention of cutting the clay?

A.—None whatever.

Q.—You do not think it could have been done?

A.—It could not have been done.

Sir Frederick Hopkinson.—I have been very puzzled about it, because I said that I knew it could not have been done, but we have been told over and over again that you did intend to do it.

A.—No one knows the intentions in my mind in the matter except myself.

Q.—I entirely agree with you that wash borings in the mud are probably as satisfactory a means of ascertaining the depth of the mud as anything you can employ, but what has oppressed me very much has been the fact that you, a man with your experience, was going to wash out that clay with a hand pump. It is quite impossible?

A.—Quite impossible. I think I have made it clear in my written statement that, coming to my personal point of view, when I arranged to take these borings, all that was in my mind was to answer one question—to myself—so to speak, namely, " Is this blue clay in this part of the harbour the same material that I have been dredging at the Indian Marine Dockyard for the last four years? "

Q.—And you satisfied yourself about that?

A.—I satisfied myself perfectly.

Q.—That it was the same?

A.—I was perfectly satisfied. And, of course, my conclusions, and what I have said, about the nature of the material were not based on what I saw by means of this pipe, but what I had seen on board the dredger bringing the stuff up day after day to the daylight.

Q.—Could that clay change in character within a few miles?

A.—It could not.

Q.—It is formed by the same action?

A.—It is the same at Sewri. It is the same in the new docks which I visited constantly with my friend, Mr. Messent, where we saw the deep cuttings for the trenches of the dock walls, and the excavation of the body of the dock exposed to sight for the height of the wall of this room. The mud was lying at the top of the cutting; the blue clay followed; then the murum, and then the hard basalt rock at the bottom.

Q.—Then you have seen what, apparently, no one else connected with the Bombay Reclamation has been able to see—the actual blue clay dry; that is to say, you have seen it with your own eyes?

A.—Yes, lying in its natural condition.

Q.—The same as if you had been able to parcel up a piece of the sea, cut the front right away, go down in a diving bell and seen the actual conditions?

A.—Quite.

Q.—Therefore, you had the best opportunity possible of forming an opinion as to the character of the material which the dredgers were to dredge?

A.—A perfect opportunity.

Q.—And your description of the clay was based upon what you actually saw?

A.—Upon what I have seen and what I have handled and felt with my own hands.

Q.—Were you asked any questions by Sir George Buchanan, or anyone representing him, in 1919, as to whether you could give him any help in making up his tender, or in making him understand the physical characteristics of the material?

A.—I was never approached by anyone at that time.

Q.—I take it you could have been found at any time. Your address is always in the Institute list?

A.—Yes.

Q.—Do you know if Sir George Buchanan knew that you had been in Bombay?

A.—Yes, he certainly knew. As a matter of fact I met Sir George Buchanan in Bombay both before and after he undertook this work.

Q.—He did not ask you any questions about it?

A.—None whatever about the material.

Q.—I presume that had he asked you, you would have placed your knowledge at his disposal?

A.—Emphatically. I prefer to put it in this way: had the Bombay Government asked me to assist Sir George Buchanan, I should gladly have done so.

Q.—You said to the Chairman this morning that both the "Jinga" and the "Kalu" did better when they were working in the clay than when they were working in the mud?

A.—I am not sure about one of them—that she ever did work in the blue clay. The only one I can speak to is the "Jinga."

Q.—She did better in the clay than in the mud?

A.—Yes, she did better in the clay than in the mud.

Q.—We know her maximum average output was 1,426 cubic yards an hour?

A.—Yes. I think my figure for the clay was 1,480.

Q.—We have the actual official figures from the Port Trust. Was Mr. Messent satisfied with the way the dredger cut the clay?

A.—He told me he wished they had started upon the clay at a much earlier stage.

Q.—Could they have chosen? Would not they have had to take the mud off first?

A.—No. For some years after the work was commenced they deliberately skimmed the mud from over the top. Mr. Messent's experiments in the blue clay, as I think I have explained, arose out of a conversation with me. Up to that time his dredging masters had been extremely obstinate in refusing to tackle the blue clay.

Q.—You told us that this morning. What I want to get at is this. Do you think they got as much out of the "Jinga" as it was possible to get in that 1,426 yards an hour?,

A.—I think not, perhaps for this reason. I think the dredging masters may have been to some extent genuinely doubtful of the capacity of these boats to work the blue clay, and that they probably handled their vessels rather carefully.

Q.—But surely the dredging masters would be encouraged to give the maximum output, would they not?

A.—No doubt they would, but I have sometimes wondered whether the magical effect of a bonus would not have procured very much better results. In that connection I may tell you that in regard to the works at the Marine Dockyard, I had hired one of the Port Trust dredgers. A dredger was provided by the Indian Government, but it was a very poor one which I rejected. I negotiated with the Port Trust for the use of one of their boats—a vessel which had been working in Bombay Harbour for some 15 years before that time, and with the same crew on board who had been there for some years previously. We got outputs very much in excess of the best outputs which had ever been obtained in the Port Trust operations.

Q.—Did you say that was a bucket dredger?

A.—Yes, and I attribute those better results solely to the fact that I paid the crew a bonus on results.

Q.—It is purely a question of working?
A.—Yes—the operation of the ship.

Q.—That is to say, if you neglect to keep your winch going, you are not dredging anything?
A.—Quite so.

Q.—With regard to Back Bay, would you care to take the dredger "Colaba," costing £250,000 into Back Bay to dredge a hole for herself to lie in at low water?
A.—A very dangerous operation.

Q.—Would you go so far as to say that the fact that a dredger has done this—not the "Colaba" but the "Kalu"—shows that she has been extremely lucky?
A.—I would indeed. If you could tell me what part of the year she did it in, I could perhaps emphasise it.

Q.—I think it was in December.
A.—That was about the best month that you could have risked the experiment.

Q.—As a matter of fact the "Colaba" never went there, but it was in their programme of 1923 or 1924 to take it there.
A.—I think you have told me that the "Colaba" was the booster?

Q.—She was going to work in conjunction with another dredger in Back Bay, so that in all probability they would be going to have £500,000 worth of dredging plant in Back Bay.
A.—An extremely risky operation.

Q.—Actually the "Kalu," which was able to dredge 2,000 yards an hour, worked for practically a whole season in Back Bay, and she did 15,600 yards for the season.
A.—Eight hours' work (i.e., eight hours at 2,000 cubic yards per hour)?

Q.—No—only daylight tides. They went in at high water on the daylight tide; they picked up their moorings; they connected the ship up to the delivery line; they dredged for an hour, or an hour-and-a-half, and then had to run away again. Would you call that sound practical working?
A.—No—very unsound indeed.

Q.—You would not be surprised at the end of the season to know that your dredging had cost you 10*s*. a yard, would you?
A.—I should expect it.

Q.—In fact you would probably expect something a good deal more? The total cost of the dredging in the 1919 estimate, including machinery and working, was 8 annas a cubic yard.
A.—You mean 8 annas against all the items which are included in my estimate at 9 annas 3 pice in 1912?

Q.—Yes. Taking our figure of the cost in 1919 being three times as much as the cost in 1912, Sir George Buchanan's cost ought to have been 27 or 28 annas?
A.—Yes. My costs in 1919 would have been 27 annas 9 pies, including capital cost of plant.

Q.—We know that the dredging plant cost £850,000. If you divide that by 25 million, the total quantity of dredging to be done comes to almost exactly 8 annas. Therefore, under the 1919 estimate, you have got to do your dredging for nothing at all?
A.—Quite so.

Q.—That is the position.
A.—It is amazing.

Q.—Have you seen Sir George Buchanan's report?
A.—No.

Q.—How long did it take you to make up your report of 1912, including taking the borings?
A.—The actual time I was engaged was from the month of January, 1912, until late in August in the same year.

Q.—That is eight months?
A.—Call it seven.

Q.—What staff of engineers did you have with you?
A.—I had one engineer only, with two sapper N.C.O.s, who were doing observation work on the Survey.

Q.—Did you take any cross-sections of the reclamation area?
A.—We took a few to verify a very valuable plan that was already in the possession of the P.W.D. This plan seemed to me to bear all the internal evidence of having been so thoroughly well done that instead of taking a complete series of sections myself I checked three or four of the main points, and found them to compare so closely with this plan that I accepted the plan.

Q.—From that you were enabled to calculate the total quantity of filling required?
A.—Quite so.

Q.—It is rather a curious coincidence that in non-detailed plans such as that, you and Sir George Buchanan agree to a yard.
A.—Yes. That plan, I take it, is still in the possession of the Bombay Government.

Q.—Unfortunately we have not got it.
A.—It is an old plan dating back perhaps to many years before.

Q.—To show how well known it was, in this report from the Government of Bombay to the Government of India in 1911, on page 6, it says: "I am therefore to point out that the large reclamations being carried out by the Port Trust afford exceptionally complete data for estimating work of this kind." So that it was well known that the Sewri work had been done quite recently?
A.—Yes. It was in progress in fact at the time of my report of 1912.

Q.—Sir George Buchanan makes a point on page 9, second clause of paragraph 28, to this effect: "It is usual, when preparing estimates for a project of this magnitude, and especially when the estimates are those on which the authorities are asked to sanction the execution of the work, for all details to be furnished, but in this case details are left to imagination." If you will turn to a comparison of your estimate and Sir George Buchanan's on page 13, in 1919 he gives an estimate of what he thinks it ought to have cost in 1912, from which he gets a much lower price than you; but if you go to his final estimate on page 29 you will there notice that he gives identical items with your estimate, except that in the case of the sea wall he splits your one item up into six items, three of them being quite small amounts. You say you have not studied Sir George Buchanan's report?
A.—This is the first time I have seen it.

Q.—Otherwise I was going to ask you to tell us how you thought it compared with yours in the matter of details; but you cannot do that?
A.—I should need time to do it.

Q.—Did you have any conversation with Sir George Buchanan about the quality of the clay?
A.—Never.

Q.—Then you cannot tell me how he gets the idea which he puts into the paragraph at the bottom of page 9, that it is hard clay?
A.—Does he say it is hard clay?

Q.—He definitely say that at the bottom of page 9, the last line but one.
A.—I have not the slightest idea. That is a word which I have never myself used. I have called it stiff, but never hard.

Q.—He says on page 10 at the bottom of clause 31: "Moreover, the solid wall as proposed by Mr. Kidd would be very difficult and very costly to build, and would take a number of years to complete." Your estimate for the wall, I think, was 64 lakhs, was it not?
A.—Yes.

Q.—Sir George Buchanan's estimate was 118 lakhs?
A.—On the ratio we have already agreed, of three to one, the cost of the sea wall, according to my design, in 1919 would have been 195 lakhs.

Mr. Billimoria.—I will ask you one or two general questions first, and then I shall trouble you with regard to a few figures in Sir George Buchanan's estimate, compared with the figures in your original estimate of 1912. The item regarding storm-water drains was evidently overlooked by you in your estimate, since 59 lakhs could not possibly include roads, lights, sewage drains and storm-water drains?
A.—My answer to that is to say that Mr. Kemball, after discussion with me upon this question of roads and drains, decided it would be better that his department should become responsible for that estimate, and supply me with a figure to be incorporated in mine.

Q.—That is quite true, but the item of storm-water drains is as important an item as any of the items in connection with this reclamation?
A.—Quite.

Q.—And evidently it seems that it has been overlooked?
A.—That I do not know.

Q.—Supposing the Government had decided to employ you on the job, and supposing an eminent engineer had taken a number of borings and carried on an exhaustive survey, would you have depended upon his report entirely, or would you have made your own independent investigations and surveys before embarking on the scheme?

A.—I should have felt that it would be quite impossible for me to take part in the design of the dredger without seeing the material for myself quite irrespective of what might have been said by my predecessor.

Q.—You are also of the opinion that the builders of the dredger ought to have been familiar with the material which the machine was intended to dredge?

A.—I think in this case of the Bombay reclamation that Sir George Buchanan and his builders should have gone out to Bombay, and have hired a dredger from the Port Trust, and in the course of a very few weeks have satisfied themselves by digging here and there over the area to be dredged of what was exactly the nature of the material.

Q.—As far as your information, your survey, and your borings go, can you say that the material in the harbour is soft clay and not hard clay?

A.—I have never described it as soft clay. I do not agree that it is hard clay, but I have described it as soft clay.

Q.—You described it as stiff clay?

A.—Stiff and unctuous.

Q.—Would not there be a material difference between soft clay and hard clay?

A.—There might be a considerable difference, yes—a material difference for this purpose.

Q.—If a dredger was built for stiff clay, the specifications supplied to the dredger builders would be absolutely incorrect?

A.—I do not know what that specification was.

Sir Frederick Hopkinson.—A dredger that would dredge hard clay would in any case dredge soft clay equally well, would it not?

A.—Surely.

Mr. Billimoria.—I have not followed your answer.

Chairman.—He said a dredger that would dredge stiff clay would manage soft clay or any other kind of clay.

A.—But not necessarily hard clay.

Mr. Billimoria.—Therefore, if they were supplied with a specification to build a dredger for soft clay, that dredger could not be expected to get out hard clay?

A.—Or even stiff clay.

Q.—In that respect therefore the specifications would be absolutely incorrect?

A.—If the specifications said it was soft clay, they were absolutely incorrect.

Chairman.—Mr. Billimoria is referring to page 20 of Sir George Buchanan's report. (*Handing same to witness who perused same.*)

A.—All I can say about this paragraph is that if the dredger was designed for dredging 2,000 cubic yards of soft clay per hour, I am not surprised that she has made a very much less performance in stiff clay.

Mr. Billimoria.—Since you have that copy of the report in your hands, I will trouble you to turn to page 8, paragraph 25: "Meanwhile Mr. Kidd had, in July, 1913, submitted a proposal to spread the work over a period of 24 years and to divide the reclamation into sections, and he made an effort to carry out the first section of 84 acres for a sum of 37 lakhs." Is this different from the 1912 estimate?

A.—No. It is merely a portion of it as far as the figures go. No doubt they were modified to suit a very much smaller bulk of work.

Q.—You did not prepare separate estimates in 1912, 1913 and 1919. I am coming to 1919 in a moment.

A.—I must have prepared a special estimate for this sum of 37 lakhs which is referred to in this paragraph.

Q.—I am not concerned as much with this figure of 37 lakhs as with regard to the period and the sections. Did you not think it prudent that the work of reclamation should be carried on by sections and not as a whole? Did you not think it would have been much more in the interests of the Government if the work was carried out in sections?

A.—My advice to the Government was to carry out a substantial section of the work in the first instance; then to go slow, or possibly to stop, in order to ascertain at what rate land was likely to be taken up; then, as it was being taken up, to adjust the progress of the dredging henceforth to the rate at which the land was being sold.

Q.—If you will turn to page 13 of the Report you will find that you estimate your pump filling in 1912 at nine annas three pice a cubic yard?

A.—Yes.

Q.—Turning to page 8 of the Report, paragraph 25, in July, 1913—a short time thereafter you increased that rate to eleven annas three pice, after your subsequent experience that prices were gradually going up?

A.—Yes, that is quite true.

Q.—If you turn to page 9 of the Report, in paragraph 27 (*b*) you will find that in 1919 you increased the rate of murum topping to three rupees eight annas against your estimate of one rupee twelve annas in 1912?

A.—Yes.

Q.—That is because you took account of the fact that prices were advancing rapidly?

A.—Clearly.

Q.—Any comparison, therefore, made in Table A on page 13 between your figures and the figures which Sir George Buchanan gives in his estimate of 1912 could not stand in view of what is stated in those very paragraphs of Sir George Buchanan's Report?

A.—Quite so.

Q.—Turning to page 12 of Sir George Buchanan's Report you will see in the middle of the page " From Mr. Kidd's plans I see he proposes seven pipe lines across the peninsula. I think this number is excessive and have reduced the number to three." Have you any remarks to offer on that? Do you agree with Sir George Buchanan in reducing the number of pipe lines to three?

A.—No, I adhere to seven.

Q.—You think seven pipe lines is a sounder proposition than three pipe lines?

A.—Clearly.

Q.—Then on page 15, Paragraph 45 (*b*) you have again repeated that the completion of the work should take 24 years, thus avoiding payment of interest charges on the capital involved in the whole scheme until there is some certainty of the disposal of the whole of the land?

A.—Quite so.

Q.—You still adhere to that view?

A.—Yes. Of course the figure of 24 years would naturally have been dependent upon the policy upon which the calculation was made; that is to say, keeping the progress of the work just a little in advance of the taking up of the land.

Q.—The matter has to be considered not only from an engineering point of view but from a financial point of view as well?

A.—Yes.

Q.—You will agree with me that the financial aspect is very closely allied with the engineering project?

A.—Yes.

Q.—It is no good launching out on an engineering project without being sure of your finances?

A.—Quite so.

Q.—Will you now turn your attention to page 13, Paragraph 39? Sir George Buchanan differs from you and points out that the principal difference between you is the rate of pump filling. He says " Mr. Kidd's price being nine annas three pies per cubic yard compared with my rate of five annas, which is based on actuals for the class of work." What remarks have you to offer with regard to that?

A.—I will quote Sir Frederick Hopkinson who pointed out just now that the rate of eight annas was no more than equivalent to providing the capital cost of the plant, leaving nothing at all for doing the project.

Q.—Do you say that the rate of five annas was anywhere near the mark in the year 1919.

A.—My relative figure for the year 1919 would be 27 annas 9 pies—three times my original estimate.

Q.—Then on page 15, Paragraph 46, Sir George Buchanan says: " I have divided the work into four sections, and on the assumption that the sanction was given on, say, 1st January, 1920, I estimate that the work should be completed by the following dates," and on the following page he gives four sections completing the whole reclamation by December, 1926. Do you think it was ever possible to have done that?

A.—Obviously it was never possible with the plant which is there now.

Q.—If you will kindly turn to page 13 I will just trouble you with regard to some comparative figures. Item 2, with regard to moorum filling, is taken in your estimate in 1912 at 1 rupee, 12 annas?

A.—Yes.

Q.—The quantity being 2,600,815 cubic yards?

A.—Yes.

Q.—In Sir George Buchanan's estimate in Table B he reduces the quantity to 1,919,000 yards?

A.—Yes.

Q.—Which gives a difference of about 681,000 cubic yards?

A.—Yes.

Q.—Can you explain why he takes a smaller quantity there?

A.—I presume because he divided the area into a lesser number of sections than I had provided for. He had fewer cross banks to divide the work.

Q.—That would reduce the quantity?

A.—Yes.

Q.—He takes a rate of 2 rupees, whereas in January, 1912, you have assumed a rate of how much a cubic yard?

A.—So that my 1919 rate would be five rupees, four annas approximately.

Q.—Against 2 rupees?

A.—Yes.

Q.—Therefore, a figure of 48 lakhs is hopelessly out of the mark?

A.—Yes; quite hopelessly.

Q.—I do not know whether you have in front of you a copy of the revised estimate approved by Sir George Buchanan in 1922, in which he takes moorum toppings at 6 rupees, and the expenditure therefore is estimated at 60 lakhs?

A.—No; I have not.

Q.—That is the figure. I have marked it in blue pencil. (*Document handed to the Witness*).

A.—Thank you.

Sir Frederick Hopkinson.—Is that a cubic yard?

Mr. Billimoria.—He says a 6-rupee rate. It must be a cubic yard.

A.—Curiously enough, it does not say what it is. It says the quantities and gives the figure. I think it is cubic feet. It is percentage of cubic feet.

Sir Frederick Hopkinson.—This is moorum topping.

Mr. Billimoria.—That is the estimate approved by Sir George Buchanan in 1922. Probably that figure is not out of the mark, but in any case his figure of 38 lakhs is an impossible figure?

A.—Clearly.

Sir Frederick Hopkinson.—I do not understand this.

Mr. Billimoria.—Six rupees at 10 lakhs makes 60 lakhs.

Sir Frederick Hopkinson.—It is per brass—it is something under 2 rupees a cubic yard?

A.—Yes.

Mr. Billimoria.—When Sir George Buchanan drew up this report, he himself, at page 9, refers to what you yourself stated, that in 1919 prices had greatly enhanced. The actual words are that you made an offer on behalf of your firm to reclaim a gross area of 350 acres, but at greatly enhanced rates. That is paragraph 27 (*b*).

A.—Quite so.

Q.—So he had before him this very fact while he was writing this report, that prices had greatly enhanced?

A.—Surely.

Q.—Can you, as an engineer of experience, explain how in view of that opinion, when a person is writing a report he could take a figure far less than what is stated there?

A.—I have always been amazed at the simple fact that Sir George Buchanan's original estimate after the war was a lesser figure, or an approximate figure to mine made in 1912. That has always been an incredible fact to me.

Sir Frederick Hopkinson.—Not less than yours; it was slightly more.

A.—Slightly more.

Chairman.—It was 325 lakhs to 367 lakhs.

A.—The difference is immaterial to my remark.

Mr. Billimoria.—In arriving at the figure of 367 lakhs Sir George Buchanan deducts, or takes credit for, 10 lakhs of rupees in respect of plant; whereas in your estimate, which, I take it, was much more conservative and safe, you made no allowance in respect of any such reduction for plant?

A.—The plant was entirely charged in the estimates.

Q.—That means you expected the plant would have depreciated by the time the work would have been completed, and would be entirely without any value?

A.—It would have no value.

Q.—So, deducting 10 lakhs for the value of the plant would also paint a more rosy picture of the situation?

A.—I think so.

Sir Frederick Hopkinson. The value of the plant was so problematical as to be not worth considering.

A.—You could not think seriously of the chances of a sale.

Mr. Billimoria.—If any engineer was submitting an estimate which was to be on the safe side he would not make deductions of such large amounts from the estimate in respect of any figure which is only hypothetical or problematical.

A.—I think so.

Q.—Your rate of 9 annas 3 pies in 1912 includes the cost of the plant?

A.—It does.

Q.—So that if the plant were to cost three times as much the rate would advance proportionately?

A.—Certainly.

Q.—In spite of the definite fact that the value of the plant had increased considerably against your estimate of 41 lakhs on Sir George Buchanan's own figure of 61 lakhs it was not possible to estimate at 8 annas for pump filling?

A.—No; it is an absurd price, in my opinion.

Q.—Even assuming it at 61 lakhs it was not possible because the value of your plant which you have given us is £272,625 plus £15,000 = £287,625?

A.—Yes.

Q.—Which, taken at 15 rupees to the £, works out at 41 lakhs—61 lakhs is taken on the basis of 12 rupees to the £?

A.—Yes.

Q.—Therefore, the rate of 8 annas is hopelessly out of the mark?

A.—It is inadequate.

Q.—Will you turn to page 14 of Sir George Buchanan's report. In paragraph 43 he says: " The Back Bay reclamation scheme is a straightforward project without any of the difficulties that attended the Rangoon scheme." It was pointed out to you by Sir Frederick Hopkinson that he talked about the difficulties of the Port Trust on page 6 of the same report at the fifth line from the bottom of the page: " The difficulties which have arisen with the Port Trust dredgers serve as a warning on this point." Could you reconcile those two statements?

A.—I do not quite see the connection. I do not take the point in your mind, I am afraid.

Q.—It is a straightforward project without any of the difficulties.

A.—Yes.

Q.—He says at page 6 that the difficulties that the dredger had to meet with serve as a warning. If you want to leave that conclusion to the Committee, I have no objection

A.—I think it is more a question for them. My personal opinion on these points is of no value to the Committee.

Q.—Could you say that an estimate has been prepared with due care and consideration if within a short time thereafter the figures of cost should run into double the figure of the estimate? Is that possible if the conditions have remained just the same?

A.—It is a very bad estimate, of course.

Q.—If any individual corporation or Government were induced to launch into a scheme on the basis of that estimate would you consider that that body was let down?

A.—Evidently.

Chairman.—We are very much obliged to you for your evidence.

A.—If I can assist the Commitee any further at any time I am quite ready to do so.

Chairman.—Thank you very much.

(The Witness withdrew.)

SUPPLEMENTARY NOTE BY MR. W. KIDD.

18th October, 1926.

SIR,

ARISING out of my examination by the Committee on the 5th inst., I beg to draw attention to the question of the relative estimates of cost of dry moorum from the hills and mud and clay from the harbour for completing the filling of the reclamation.

Sir M. Visvesvaraya says " We have made enquiries and we find it possible to get moorum at 1 rupee 4 annas or less, " delivered to the site." And again, " If we get it for 1 rupee 4 annas, the cost will be 350 lakhs for 28 million cubic yards."

Answering Sir Frederick Hopkinson I state that " my cost (for filling) in 1919 would have been 27 annas 9 pies." I should have added, " including the capital cost of plant, staff and general expenses."

Lest it should be inferred from my answer as it stands that this rate for harbour dredging represents my present estimate, I have to point out that my present rate for dredged filling is *not more than* 12 *annas per cubic yard*, assuming that the present cost of operating the dredging plant will be about double that of 1912 and allowing for the capital cost of altering the plant so as to render it of the same efficiency as I provided for in 1912 estimate.

The relative cost of completion by the two materials will therefore be :—

(*a*) By dry moorum from hills :

28,000,000 cubic yards at Rs. 1.4.0	= 350 lakhs.
(*b*) By pump-filling from harbour :	
Dredged filling, 26,000,000 at annas 12	= 195 ,,
Dry moorum, 2,000,000 at Rs.1.4.0	= 25 ,,
Total	220 ,,
Difference in favour of pump filling	130 ,,
or at exchange 1*s.* 6*d.* per rupee	£975,000

I would further submit to the Committee that there is no greater certainty as to the cost of moorum filling than that of harbour dredging. The uncertainty as to the cost of so large a quantity as 28,000,000 cubic yards of dry moorum filling arises from the fact stated in the course of my evidence : " As you are probably aware, you may have moorum in all degrees of hardness, from quite loose earth up to very hard rock. It is all a question of the amount of its decomposition and of how near the surface it may be." That remark is specially forcible when 28,000,000 cubic yards is the quantity in contemplation.

I would like to emphasise my remark : " Lest I be thought to agree that the substitution of moorum filling for pump dredging is a sound way, that everything depends on the efficiency of your dredging machine. I still say that I am perfectly convinced that the reclamation can be filled up more cheaply to-day by means of an efficient dredging-machine properly worked than it can be by any other method, and nothing has happened to persuade me that this is not so."

I have estimated 12 annas as an outside price. If the Committee will give me the ratio of cost of coal, stores and crew's wages, 1912 to present time, and also lend me the machinery plans of the dredger, I will prepare a closer figure.

49th Witness, Mr. T. McMurray, representing the Firm of Wm. Simons & Co., Ltd., Renfrew.

WRITTEN STATEMENT OF MESSRS. SIMONS & CO.

Questions 17, 18, 19 and 20 of the questionnaire appear to be the only items relating our work and we submit the following replies :—

Q. 17.—Were the specifications and designs of Sir George Buchanan for the dredger " Sir George Lloyd " (hereinafter called the dredger) and the " Colaba " fit and proper for the intended work?

A.—The answer is yes if the reference is to the Specification and Design to which the dredger was built and the work referred to therein.

Q. 18.—Did the makers guarantee that the dredger would discharge 2,000 cubic yards of soft clay per hour through a floating pipe line to a distance of 5,000 feet?

A.—The answer is no. For us to give a guarantee of output on a contract such as that, we would require a guarantee as to the nature of the materials to be dredged and complete freedom of control during the guarantee.

We would say, however, that there is no possibility of the dredger failing to give the output named when working in soft clay under any reasonable conditions of operating.

Q. 19.—Did the dredger before delivery under proper test conditions in fact give the guaranteed output?

A.—The dredger was tested on the Clyde in soft clay and excavated at a rate about 75 per cent. in excess of that specified, and her pumping power was found to be well in excess of that required to meet the requirements of the specification.

Q. 20.—Was the dredger, when delivered, in all respects in accordance with the contract?

Was also the " Colaba," when delivered, in accordance with the contract?

If not, in what respect or respects did one or other or both fail to conform thereto?

A.—The answer to both questions is " Yes "

ORAL EVIDENCE.

Chairman.—What is your Christian name?

A —Thomas.

Q.—You are Director of Messrs. William Simons & Company?

A.—Yes.

Q.—You have given us a very short statement in which you have dealt with the answers to Questions 17, 18, 19 and 20?

A.—Yes, it is very short.

Q.—Question 17 is : " Were the specifications and designs of Sir George Buchanan for the dredger ' Sir George Lloyd ' and the ' Colaba ' fit and proper for the intended work? " Have you got the questions?

A.—I believe I have, but I remember the questions perfectly well.

Q.—You say the answer is : " Yes, if the reference is to the specifications and designs to which the dredgers were built and the work referred to therein "?

A.—That is so.

Q.—I do not know that I quite understand that answer. The question, if you will turn to it, asks whether the specifications and designs of Sir George Buchanan, whether for the dredger " Sir George Lloyd " or the " Colaba," were fit and proper for the intended work?

A.—We never saw any specifications and designs from Sir George Buchanan. We do not know what they mean by them, and, therefore, I have made that answer. The only thing that we saw that came from anybody else than ourselves were the specifications and designs that came from the Director-General of Stores, India Office.

Q.—The intended work, as you know, was to dredge if necessary to a depth of 70 feet below water level and to discharge 2,000 cubic yards of soft clay per hour through a floating pipe-line of 5,000 feet?

A.—Quite so.

Q.—I rather question whether your firm could answer Question 17?

A.—We could not. We did not know. As I say, we never saw any specification.

Q.—Coming to Question 18 we get quite a different state of affairs. " Did the makers guarantee that the dredger would discharge 2,000 cubic yards of soft clay per hour through a floating pipe-line to a distance of 5,000 feet." You say : " The answer is ' No ' "?

A.—That is so. We never gave any guarantee that the vessel would ever do anything of the kind in Bombay.

Q.—I am not asking you about " in Bombay." The question does not say anything about Bombay. Look at the question?

A.—Yes, I see the question perfectly. We never gave any guarantee to do anything of the kind, neither at Bombay nor anywhere else.

Q.—Did you guarantee her to do anything?

A.—No, we did not guarantee her to do anything.

Q.—What did you guarantee her to do?

A.—The only guarantee that we had there was the guarantee against faulty workmanship and material. We built the dredger to certain designs and specifications which gave complete dimensions for engines, boilers, ship and everything else.

Q.—But surely the specification started by saying : " The dredger is to be capable under ordinary working conditions of excavating 2,000 cubic yards per hour of soft clay from depths up to 70 feet below water level and deliver the spoil through a floating steel pipe of 5,000 feet long "?

A.—The specification says so, and the dredger can do it.

Q.—That is not my question. My question is : Did not the makers guarantee that the dredger would do that work described as I have read it?

A.—That was my answer in the first instance, that we did not guarantee it. We did not give any guarantee whatever with regard to output. That is a plain fact. It is not a matter of opinion.

Q.—Did you not undertake this contract on the basis that you were going to turn out a dredger to be capable under ordinary working conditions of doing this—there is the general description, look at it?

A.—I have seen it. I know that perfectly well.

Q.—Then just answer the question. Was not that the basis upon which you undertook the contract?

A.—No.

Q.—Is it your case that it would not matter the least to you whether the dredger could turn out 500 cubic yards or 1,000 cubic yards or no cubic yards?

A.—No, it is nothing of the kind. The vessel was tried here on the Clyde to the satisfaction of the India Office people to say whether or not she was according to the specification.

Q.—Was not the specification for a dredger to be capable under ordinary working conditions of excavating 2,000 cubic yards per hour?

A.—Yes, and she did more than that on the Clyde. She did 75 per cent. more than that.

Q.—Then turning back to Question 18 is not your answer " Yes " instead of " No," that the makers did guarantee it?

A.—No, we never gave any guarantee.

Q.—Is that your view of it? Are you serious about this? You are not playing with us over it?

A.—No, I am as serious as anybody can be.

Q.—I hope you are.

A.—I am much more serious than anybody else probably in connection with the thing.

Q.—I have pointed out to you the general description and asked you whether the answer to Question 18 should not be " Yes," and you say the answer should be " No "?

A.—That is so. We gave no guarantee, either written or any other kind of guarantee.

Q.—I do not know whether you are quarrelling over a particular word. Did you undertake that you would deliver a dredger which under ordinary working conditions should be capable of excavating 2,000 cubic yards per hour of soft clay?

A.—We put forward, in the first instance, proposals showing vessels which we believed would be capable of doing that work. We did so in the first instance. When the thing was first discussed we put this forward and we believe that the vessel will do 2,000 yards of soft clay per hour through 5,000 feet of floating pipe-line. We are still of that opinion.

Q.—That is not my question. My question is: Did you undertake to deliver a dredger to be capable under ordinary working conditions of excavating 2,000 cubic yards per hour of soft clay?

A.—We did according to the specification.

Q.—Did you undertake to deliver a dredger capable of these details which I have read. Answer yes or no first of all.

A.—I am sorry, but I do not quite grasp the point of your question.

Q.—I cannot make it clearer, but I can repeat it. Did you undertake to deliver a dredger capable under ordinary working conditions of excavating 2,000 cubic yards per hour of soft clay?

A.—We undertook to deliver a vessel according to a specification and designs set before us which we believed was quite sufficient to enable that vessel to do that output you have indicated.

Q.—Surely the answer must be yes when a specification is sent to you and you are told that the dredger is to be capable of doing that. Do read the question. You say you know it, but do read it. Look at the specification. (*Document handed to the Witness.*) There is the document under your own signature. If you turn to the end of the document you will see there is your own signature.

A.—I have read it and know it perfectly well.

Q.—Have not you pledged yourself there that the dredger is to be capable under working conditions of dredging 2,000 cubic yards of soft clay per hour?

A.—It comes to this, as far as I can see, that in the first instance we are speaking of the word " guarantee." In my mind we have no guarantee written in which we write out that we will guarantee to do so and so. That is Question 18. That is why the answer comes to that.

Q.—Did you promise that they should have a dredger that would under ordinary working conditions do these things?

A.—We contracted to build a dredger according to the specification.

Q.—Then did you contract to build a dredger capable under ordinary working conditions of dredging 2,000 cubic yards of soft clay per hour to a depth of 70 feet? Did you contract to do it?

A.—We contracted to build this dredger according to the designs and specifications and dimensions that are here. This vessel was to be tested on the Clyde, and that was the end of it so far as we are concerned.

Q.—Then I will not ask you any further question on that.

A.—I am sorry that I cannot quite see that point, but my point is that we have no definite guarantee for this.

Q.—I think you are definitely fencing with the matter, and are not answering the question honestly and openly. That is what I think.

A.—Well, if that is so I had better leave this table. There is no good in my sitting here if you think that.

Q.—There is your own specification under your own signature, and I ask you if you did not promise, and did not undertake, or did not contract—we will leave out the word " guarantee "—to deliver a dredger capable of delivering 2,000 yards?

A.—We have this contract to do this vessel according to certain designs. We have no written guarantee that we will go to Bombay to do it.

Q.—I have said nothing about Bombay, and I have definitely omitted the word " guarantee " because you are shying at the word " guarantee." I ask you to look at that document once again—I shall not repeat my question—and ask you whether you did not promise or undertake or contract—use either of the three words you like—to deliver a dredger capable of dredging 2,000 cubic yards per hour of soft clay, and deliver it through a pipe line of 5,000 feet?

A.—I think I see your point.

Q.—I hope you do.

A.—I may be rather slow about it, but we have accepted this specification, which says that the dredger shall be capable of doing that, and we agreed to do that. We have accepted it.

Q.—Then the answer to question 18 is yes, and is not no?

A.—No; we gave no guarantee, not in my interpretation of the word " guarantee."

Q.—Then we come to question 19 : " Did the dredger before delivery under proper test conditions, in fact, give the guaranteed output? " If you did not guarantee something what was the object of the trials on the Clyde?

A.—The object of trials on the Clyde was for the India Office representatives to satisfy themselves that the dredgers were capable of delivering all that was specified.

Q.—That the dredger was in accordance with the contract?

A.—In accordance with the contract and specification—that is so.

Q.—One term of the contract, for instance, was that she should do eight knots?

A.—That is so.

Q.—Another term of the contract is that she shall have sufficient pumping power to pump the reclaimed material through 5,000 feet length of pipe?

A.—Yes; the whole thing is for that purpose.

Q.—Another term of the contract was that she should be able to dredge soft clay at the rate of 2,000 cubic yards an hour?

A.—That is so. That is what I have stated here—that it is capable of doing that.

Q.—Then the answer to question 18 must be yes and cannot be no. About the trials on the Clyde, we have been told that it is impracticable to put a 5,000 feet pipe line on the Clyde.

A.—I beg your pardon.

Sir Frederick Hopkinson.—We do not accept that.

Chairman.—We have been told that it is impracticable to put 5,000 feet of pipe line on the Clyde.

A.—It is not impossible.

Q.—Impracticable.

A.—I think it is impracticable, but it is not impossible.

Q.—It is not impossible?

A.—No; it is not impossible.

Q.—Were you present at these trials?

A.—No; I am sorry I was not.

Q.—In fact, as you know, the " Sir George Lloyd " pumped through a pipe line that merely passed behind her stern?

A.—Yes; it was only the length of the ship.

Q.—Whether her pumping capacity was sufficient to deliver 2,000 cubic yards to a distance of 5,000 feet depended on some mathematical calculations?

A.—I do not know anything about mathematical calculations. I take it you mean that the people who were testing the vessel satisfied themselves by that means.

Q.—What they did was they calculated a certain water pressure?
A.—Yes; equivalent to what they thought was the proper head.

Sir Frederick Hopkinson.—They assumed something?

Chairman.—They assumed a certain required power to pump 5,000 feet?
A.—I believe they did.

Q.—And then they made an experiment with regard to water pressure?
A.—I believe they did. I believe that is what happened.

Q.—Is the " Sir George Lloyd " the biggest machine you have ever built as a dredger?
A.—No; I do not think she is the biggest machine we have built as a dredger.

Q.—Up to 1919?
A.—I think, on the whole, she is the most powerful pump plant perhaps, though we have had one with 51 inches discharge pipe instead of 42 inches.

Q.—Would that be before 1919?
A.—Yes.

Q.—Are you able to say whether or no the " Sir George Lloyd " ever got the contract speed on her trials?
A.—I believe she got over the contract speed on her trials—you mean steam, propelling?

Q.—Propelling.
A.—I believe she did.

Q.—If you look at the figures you will find she did not, but she got over eight knots after they had sheathed in her bows.
A.—That is the time I am thinking of; not when she was steaming with an open bow. They changed the propellers, I believe, or something like that. You see, the question of speed was a matter of no importance. The propelling engines were only put in to sail the vessel out to India, and for no other purpose.

Q.—But the propelling engines would be wanted during her work from day to day?
A.—Very little. They might well have been left out as far as that was concerned. They would have been left out except for the bald fact that it was cheaper to put them in and steam her out than have them erected out there.

Q.—Do you really say as regards the " Sir George Lloyd "—I am now distinguishing between the " Sir George Lloyd " and the " Colaba "—that it was not essential that she should have propelling engines?
A.—Nothing of the kind. It never was. It is not now.

Q.—How would you keep the " Sir George Lloyd " up to the face that you were excavating if you had the wind and tide against you?
A.—Well, we should never use propelling engines, not on this earth. She is held up by steel wire ropes.

Q.—You do not use engines to hold her up?
A.—No.

Q.—Then she is moored as she approaches her work?
A.—Yes; she approaches entirely with wire rope. They haul her up backwards or forwards or sideways, or anyhow they want to.

Q.—When she is quite completely secured does she use her propelling engines then?
A.—No; she never uses them from the time she goes on to the spot till the time she comes off at the end of the season.

Q.—Do you remember that your firm built the " Kalu " and the " Jinga "?
A.—They did.

Q.—Were they taken out to Bombay by your firm?
A.—They were. They were sent out by us.

Q.—And tested on the spot?
A.—They were. We guaranteed to do certain work with them on the spot. That is my distinction about guarantee. With the " Jinga " and the " Kalu " we guaranteed to set those boats to work and to run them for a little time till everybody could see how the thing worked and get it in working order and to do also certain guaranteed tests—to deliver certain quantities of material which was soft clay. As a matter of fact in the first instance we had it hammered into us that it was mainly mud and very little clay about it, but when we did come to work we found that we were dealing with all kinds of stuff there in certain places. But we sent the boats out there. Our contract was to deliver them in working order and work them for a certain number of working hours.

Sir Frederick Hopkinson.—Hours or weeks?

A.—I forget for how many it was.

Q.—Was it hours, weeks or months?

A.—It was hours as stated, but it ran into about three months working or something like that

Chairman.—Before you handed over?

A.—Before we handed over. We had to do a certain number of hours per day—pump an actual number of hours per day. That is the contract we had in Bombay. It was an entirely different thing from this contract which was purely construction.

Q.—The distinction that you draw is that the specification of the " Sir George Lloyd " merely gave you a description of what was desired and that the vessel was to be passed by trials in the Clyde?

A.—Absolutely.

Q.—You never contracted that she would do anything in Bombay, in the harbour?

A.—No, not in this world.

Q.—We appreciate that. The question whether that was a prudent contract to invite you to enter into is not a matter for you?

A.—No, that is a matter for anybody else I suppose. Everybody in this world would have their own opinion about it.

Q.—I suppose I am right in thinking that your firm had never been paid £450,000 for a dredger before?

A.—I would not say that we had never had a contract extending to that figure. I would not say that.

Q.—Had you ever had a contract which amounted for a dredger, a booster and the pipe-line, to £650,000?

A.—We have had a contract for a dredger that was nearly twice the price of the " Sir George Lloyd."

Sir Frederick Hopkinson.—£500,000?

A.—Over £400,000.

Chairman.—Taking the plant as a whole, the " Sir George Lloyd," the " Colaba " and the pipe-line came to about £650,000?

A.—Yes, something like that.

Q.—That is accurate, is not it?

A.—That is the whole lot put together.

Q.—That was a pretty big contract?

A.—They were bought at an expensive time.

Q.—I am not complaining at all. Would it not in your opinion have been a prudent thing for the people who were buying this plant to invite you to give a price for bringing the plant out to Bombay and running it for three months?

A.—Well I tell you quite frankly Sir George Buchanan did his utmost to get an undertaking to guarantee in Bombay and we absolutely refused to do anything of the kind.

Q.—You say Sir George Buchanan did wish you to enter into a contract to deliver on site and work for a time on site and you refused to do it?

A.—Yes. He wanted what I would call a proper guarantee to do her work on the site in Bombay.

Q.—The same as the " Kalu " and the " Jinga " contract?

A.—Yes, I suppose that was his idea. He wanted us to guarantee this dredger would do so much work on that site.

Q.—Why did you refuse?

A.—Well, there were several reasons in connection with that, and at the moment I do not recollect the whole of them. I think one of them was that we knew from the work that we had done at Sewri with the " Jinga " and " Kalu " that there was this possibility, although we were contracting to do soft clay we might be in the position of having to do stiff clay, very stiff clay, hard clay, moorum and all that sort of thing.

Q.—But the specification had said soft clay had it not?

A.—That is so.

Q.—If you were being invited to cut stiff clay, hard clay or moorum, you would have objected to that as not within the contract?

A.—We should, and then there would be a dispute and a struggle as to who was right and what are you going to do with it.

Q.—Did you know that the " Kalu " and " Jinga " had failed to give their output, the one by 30 per cent. and the other by over 50 per cent. in four years' working?

A.—Well, I do not know that that is a correct way of putting the question if I may say so. What actually happened was that the one boat on her average working instead of doing 2,000 yards an hour for five years or something like that, worked out at about 1,500; the best of the boats is only about 1,500.

Q.—1,426?

A.—Well, I am not disputing that it is 1,400.

Q.—That is the " Jinga "?

A.—I am not disputing it. I am only taking the Port Trust's figures as given to me by the engineer who is responsible. The other one I think only did 1,100.

Sir Frederick Hopkinson.—905?

A.—It may be 905. I do not mind whether it is 900, 1,000 or 1,100. It does not really matter. The point is that after five years—at least I take it that that is your point—that it did so much less than 2,000.

Chairman.—Not after five years?

A.—Yes, after five years.

Q.—The point is that whereas the contract stipulated that the " Kalu " and the " Jinga " should each of them be capable of dredging 2,000 cubic yards an hour, in fact when you take the average of the pumping hours right over the four years you get the " Jinga " doing 1,426, which is 30 per cent. below her guarantee, and you get the " Kalu " doing 903, which is more than 50 per cent. below her guarantee?

A.—Yes. Well, we did not guarantee the dredgers to do any capacity over five years' working. We guaranteed to do it for a certain time and we did 2,750 yards an hour on the trial.

Q.—Did not you guarantee that the " Jinga " and the " Kalu " should do 2,000 cubic yards an hour under ordinary working conditions?

A.—Yes, and the " Jinga " under ordinary working conditions did 2,750 yards an hour spread over something like three weeks' work I think it was.

Q.—Can you understand how over a period of four years they got these poor results. They got 30 per cent. less in the one case and more than 50 per cent. less in the other case?

A.—It is quite clear how it happened.

Q.—Why?

A.—They had lots of things to contend with. One boat had very much more difficult material to contend with than the other, and also I always felt myself that the human element had a very great deal to do with it.

Q.—Do not ordinary working conditions cover the human element. Ordinary working conditions does not include supermen?

A.—No.

Q.—Ordinary working conditions means the ordinary working conditions of wind, weather, tide and men?

A.—Well, yes, that may be so to a certain extent, but you get conditions arise when you have disgruntled men and they cause a lot of trouble in other circumstances of life, and they do in dredging.

Q.—What evidence have you got that either the crew of the " Kalu " or of the " Jinga " were disgruntled?

A.—Well, they told me themselves that they did want to get something more in the way of money than they were getting and they were very keen on having a bonus system, and I was rather keen myself that they should have it. I think all this dredging work ought to be paid on a system whereby if the men do more work they get more money. That is the system on which they ought to work but unfortunately the people at Bombay had no experience of that. They did not care much for it and they only went to the extent of paying them a bonus on the number of hours they worked, which to my humble opinion was no reasonable way of working it at all really.

Q.—Did you leave Bombay within three months or within six months of the delivery of these vessels?

A.—I think I landed in November and the pipe-line was not quite ready. These things never seem to be ready. The dredger is always ready first. But we got the pipe-line ready and I was there until some time, I think, in May or June—from November to May or June.

Q.—That would be in 1910?

A.—That was 1909, I think.

Q.—You have no personal experience of the working of those dredgers subsequent to May, 1909?

A.—Well, I could not exactly say that because I have been passing through Bombay at least two dozen times after that while they were working. I used to go and

see Mr. Messent and the engineers in charge and hear what they had got to say; I often went to hear and see them. We had a considerable amount of trouble with the pumps in one of them on account of dealing with a lot of stones and breaking a shaft and one thing and another. I often went and saw them and they told me how they were getting on and that sort of thing. I have never known them complain about anything so far as that point is concerned, except the particular items at the moment—any little things that were giving trouble at the time, mechanical details or things like that.

Q.—Whether they complained or not we have the solid fact of their official figures which are the ones I have given you.

A.—I accept that.

Q.—Do you consider that the output of the "Kalu" and the "Jinga" were satisfactory?

A.—I never considered them satisfactory; I am one of the dissatisfied people. I always think things should be better in the way of working than they are.

Q.—What about the "Sir George Lloyd"?

A.—I think the whole thing is rather unsatisfactory.

Q.—That is all—only "rather unsatisfactory." Have you seen the figures of the "Sir George Lloyd"?

A.—I do not know that I have seen very much about it except the figures that we have had for the first year that the "Sir George Lloyd" was working.

Q.—This is what your dredger the "Sir George Lloyd" did. In 1923-24 it worked for 843 hours, and the amount of material that it dredged per pumping hour was 1,020 yards. Does that strike you as a good result for a perfectly new dredger of the power and cost of the "Sir George Lloyd"?

A.—It is absolutely impossible for any human being to answer that question unless they know what the dredger was doing in the way of material. What was she dredging? Do you know? Can you tell me that?

Q.—Let us follow that out. You say that it is impossible to answer the question whether the dredger was performing satisfactorily until one knows the type of material she was working on?

A.—That is the point.

Q.—We have been told that the "Sir George Lloyd" was working in material which might have consisted of 10, 12, or 15 feet of mud, and below that 10, 12, up to 30 feet of blue clay.

A.—Did they give any idea of the consistency of the blue clay?

Q.—Mr. Kidd spoke of it as being stiff and unctuous.

A.—Did Mr. Kidd see the clay that the dredger was dealing with?

Q.—Mr. Kidd took borings in 1912.

A.—So I understand; but did he see the clay that the dredger was dealing with?

Q.—No.

A.—We jump back to the questions of borings. That is not what the dredger was doing. That is what I mean.

Q.—This is the position. Take map 308.

A.—That is the one about the 1,300 borings.

Q.—There are 1,159 recorded borings there.

A.—Yes.

Q.—They give three sets of figures in each little circle.

A.—Yes.

Q.—The first is mud, the second is blue clay, and the third is moorum. You see the rock 70 feet down?

A.—Yes.

Q.—Sir George Buchanan, when he made his report and when the specification was drafted, made no independent survey at all, and took no borings whatever. He trusted entirely to Mr. Kidd's surveys of 1912. Mr. Kidd has been here to-day, and he has told that there was a layer invariably of mud which might vary between 6, 10 to 12 or 14 feet. Then below that older deposit of blue clay which he described as stiff and unctuous.

A.—Yes.

Q.—He said that the "Jinga" was enabled to cut that clay when she was doing the Sewri reclamation, and got a better result than when she was dredging in mud.

A.—I do not agree with him at all as far as that last point is concerned, and I think I know a great deal more about it than Mr. Kidd does.

Sir Frederick Hopkinson.—Mr. Kidd's figures are the official figures. She was cutting mud first, and then she gradually improved as she got down into the clay.

Chairman.—We can see from the figures exactly what she did.

A.—I suppose I may take it that having been working with these dredgers for three months, I do know some little thing about them?

Q.—We want your help.

A.—I know the material you were handling.

Sir Frederick Hopkinson.—You knew that before you built the dredger?

A.—Yes; we did, to a certain extent. The only point is that we met a lot of things that you did not expect to find, don't you know. We used to pump through these big boulders of quarried rock, some of them weighing over four hundredweight, which passed through that pump leaving the periphery of that runner at an average of over 4,000 feet a minute.

Q.—Is that in Bombay?

A.—In the " Jinga."

Q.—Four hundredweight stones?

A.—Yes.

Q.—How long did your pump last after doing that?

A.—I have told you already we had broken five shafts in the course of the five years.

Q.—Would not it break the impeller, the pump, not the shaft?

A.—No; it did not. I have some smaller stones in the office. They did not weigh more than 100 lbs., but they are big ones. I had an investigation and the engineer who was responsible for the thing saw the stones.

Q.—Is that the " Jinga " and the " Kalu "?

A.—Yes—stones that weighed over 400 lbs.

Chairman.—Is this in the harbour?

A.—That is in Sewri.

Q.—Mr. Kidd says that as result of a conversation he had with Mr. Messent, he persuaded Mr. Messent to put the " Jinga " on the blue clay, and when she started on the blue clay she gave much better results than when she was dredging mud alone. He pointed to those figures which I have marked in green as showing the better output when the " Jinga " was working on the blue clay. What do you say about that?

A.—I cannot accept anything of the kind—nothing of the kind. The point is this. As far as I can understand, the Sewri reclamation was always rather a sore point with Mr. Kidd because he wanted to get the contract. As a matter of fact, Mr. Messent was perfectly frank with me, and Mr. Messent told me before the contract was placed that he did want Mr. Kidd to get it. He told me so, and he invited me to go and see Mr. Kidd to see if we could not supply the plant to him. I did go and see Mr. Kidd, but Mr. Kidd was like many other people at that time—he said that the only place in this world where he would buy the plant would be America.

Q.—On page 15 of the statement he has given us he says: " I had in the Spring of 1912 the opportunity of seeing dredging of the blue clay by the cutter pumping dredger possible on a practical scale in Bombay Harbour." That is a reference to the " Jinga "?

A.—Yes.

Q.—" The Sewri reclamation was then in progress, and following a discussion with the chief engineer of the Bombay Port Trust "—that is Mr. Messent—" the dredger ' Jinga,' which had naturally then been confined to dredging soft mud overlying the blue clay, was then put on to the blue clay itself. The data of the results subsequently supplied to me by the chief engineer are not sufficiently precise to yield the exact relative figures of output as between blue clay and mud; but they show that in the period which included the operations in blue clay there was an increase of 19 per cent. over those for the total period in which the operations were wholly in mud. The material dredged, no doubt, included a small proportion of mud, inasmuch as the clay cannot in practice be dredged without the adjacent overlying mud being included." What do you say as to the ability of the " Jinga " to cut the blue clay which existed in the neighbourhood of the Sewri reclamation?

A.—Well, we cut all the clay that was there right down to the rock. We went through the mud, we went through the silt, we went through the soft clay, we went through the stiff clay, we went through the yellow clay to the moorum right down to the rock.

Q.—If you did that with the " Jinga," what was your objection to doing the same thing with the " Sir George Lloyd," which was more powerful?

A.—Well, we were asked to do this at a time when there were very high prices going for everything, and there were people coming along every day wanting to pick a berth in our yard to build a ship in. To go out there and take on a very responsible

contract to do this dredging out there—well, we really did not think we ought to do it. Besides, we thought that that was a job really for a contractor. We are only poor dredger builders. We are not wealthy contractors who can go and take a scheme for a million of money and do what they like with it. We are dredger builders.

Q.—Your point of view was at that particular time that it was not good enough business for you to take a contract with the bargain that you should take out a boat to Bombay and work her for three months?

A.—No; we did not think that was quite good enough because there might be all kinds of things arising.

Q.—I understand your answer.

A.—We poor dredger builders, as a matter of fact, do not want to be contractors. We have had a very well-known engineer invite us to build more than half a million's worth of plant in this country, to run it for 12 months, to be responsible for paying the wages of the crew, the coal and everything, and guarantee that we would not do less than so many hundred cubic yards an hour for 12 months' work. In my opinion, it was an absolutely absurd thing to ask any dredger builder to do. We are to go 5,000 or 6,000 miles away, don't you know, and set up this work and run it there on a guarantee. How could we guarantee unless we knew exactly what was in the harbour? We did not know. It is true we had been told about these borings and that sort of thing, but we did not know. We could not guarantee anything.

Q.—Is there anything in writing between your firm and Sir George Buchanan about the proposal that you should take the vessel out to Bombay and test her yourselves there?

A.—No; there is not.

Q.—Nothing?

A.—I do not know of anything. There is nothing. I think I am right in saying that; but he did ask us to do it.

Q.—I think we are agreed now that in the limited form of Question 18, if we leave out the word "guarantee" the answer is yes. You quarrel with the word "guarantee"?

A.—Yes; we want to keep that word out. You see my point. "Guarantee" in our mind is a guarantee that we going to do a thing, don't you know.

Q.—I do not attach any importance to the word "guarantee," but the rest of your answers and my questions have cleared it up.

(Adjourned.)

The Committee Assembled at 11 a.m. on the 6th October, 1926, in Committee Room "A" in the House of Lords, all Members being present.

49th Witness, Mr. Thomas McMurray, Director of Messrs. William Simons & Co., Ltd.

(EXAMINATION CONTINUED.)

Chairman.—Do you remember when it was that Sir George Buchanan said he wanted the dredger to be tested at Bombay—about what month?

A.—It was when he first spoke about the dredger. He spoke about having some guarantee at Bombay, or something of that sort, when he first spoke about it.

Q.—Do you mean he put it as vaguely as that—that it was to be tested at Bombay, or something of that sort?

A.—No; I do not think that he put it as vaguely as that. He put it in writing, as a matter of fact. No; he did not put it in writing. He suggested that, and I demurred to having a test. That was it. When he first spoke about this dredger he spoke about the work it had got to do.

Q.—What are you reading from?

A.—I am not reading from anything.

Q.—What have you in your hand?

A.—I have in my hand the first letter we have from Sir George Buchanan. It is dated the 25th July, 1919.* I presume you have a copy of it.

Q.—We will come to that in a moment. The second paragraph of that fixes, if my recollection is right, that he had had an interview with you, and perhaps more than one interview?

A.—He had only one, I believe, at that time.

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* See Appendix III.

Q.—Only one?
A.—Yes.

Q.—About how long before the 25th July would that interview be?
A.—I think, as far my recollection goes, it was only just a day or so.

Q.—A day or two before?
A.—Yes; I am not sure that it may not have been exactly the same day, don't you know.

Q.—So be it. Just tell us, as far as you can recollect it, the conversation that you had with him on this particular point that the dredger should be tested at Bombay.
A.—Well, he said he would like to get some tests at Bombay, and I suggested to him I was afraid we would rather demur to having any tests carried out in Bombay, or any guarantee in Bombay. I said: "However, you can discuss that." He proposed going down to Renfrew in order that he would be able to discuss it with all our people there, and all the staff, the heads of departments and the principals so as to go into the thing thoroughly, as he said. He wanted to discuss the thing thoroughly at Renfrew. He told me something (I do not remember the exact words) about a guarantee or tests at Bombay, and I told him that I thought they would demur at Renfrew about giving tests or guarantees at Bombay, and that they would want to be carrying out tests on the Clyde. That actually was what happened when he did go to Renfrew.

Q.—Then the matter was left at your interview, which was a day or two before or on the day of that letter, that he should further discuss the matter with your people at Renfrew?
A.—Yes.

Q.—That is it?
A.—That is it.

Q.—You are quite sure of that?
A.—Well, I am almost certain, as far as my recollection goes. I have nothing to guide me at the moment about it.

Q.—If that is so can you explain the phrase in Sir George Buchanan's letter that you have in your hand on the second page: "As in the case of the dredger 'Pelican' you built to my order, I shall be satisfied with a test in this country"?
A.—Yes. Well, I think that probably he gathered from what was said that there was very little chance of getting any tests in Bombay—any guarantee in Bombay. I think that is the reason.

Q.—That is your explanation?
A.—I think so.

Q.—That although he left your office a day or two before or on the day he wrote that letter saying that he would settle the matter with your people at Renfrew, on the 25th of July he is writing saying he will be satisfied with a test in this country?

Q.—Yes. It was not at my office. I was at his office, I believe; but it does not matter. It was then—at any rate, before he went to Renfrew to discuss the thing with them.

Q.—I suppose it is part of your duty to communicate with your people at Renfrew when clients are wanting dredgers and are having interviews with you?
A.—That is right.

Q.—I suppose you write to them almost daily?
A.—I write to them nearly every day, I think, when I am in town. I do not write to them some days, but nearly every day I write to them.

Q.—Did you report to them the interview that you had had with Sir George Buchanan?
A.—Yes; I am pretty certain that I must have reported that.

Q.—You must have?
A.—I must have reported that, but sometimes I might run up to Glasgow, and if I have an interview with somebody I do not sit down to write about it, but I go up and tell them about it.

Q.—This interview with Sir George Buchanan foreshadowed the possibility that you might have work amounting to nearly £1,000,000?
A.—Well, there was no estimate then. We made it afterwards.

Q.—Sir George Buchanan was discussing with you the likelihood of your being given a very considerable amount of work?
A.—Yes; we afterwards had in our minds that we would be in competition with other people.

Q.—Never mind about that. That is not my point. My point is that therefore must you not have reported to your people at Renfrew exactly what Sir George Buchanan said to you when you called at his office?

A.—I certainly must have told our people at Renfrew what Sir George Buchanan was saying. I may not have told them everything because, as you see from his letter, he was going to thrash the matter out at Renfrew.

Q.—Have you any letter, any entry in any diary, any writing record at all of Sir George Buchanan's ever making the request to you that the dredger should be tested in Bombay?

A.—That is a question I could not answer offhand. I would have to look it up and try and find it out.

Q.—I suppose you keep your correspondence in order in your office?

A.—Yes.

Q.—There would be no difficulty in seeing whether in July of 1919 you reported your interview with Sir George Buchanan to your people at Renfrew?

A.—I do not think there would be any difficulty in finding out what I said to our people at Renfrew.

Q.—Do you keep a diary?

A.—Yes; I do. It is a small thing. It is only to make appointments.

Q.—I meant an office diary.

A.—No.

Q.—Do you make notes of your interviews, or do you rely on your recollection when you are reporting to the people at Renfrew?

A.—I make notes always when there is anything of importance, don't you know; but ordinary things I do not make notes of. I rely on my memory.

Q.—Do you make notes in any bound books or on slips of paper?

A.—I make notes the same as I made a note yesterday on the back of a sheet of the hour of this meeting. When I get to my office I transcribe or alter that note into a letter, or something of that sort, and send it to Renfrew.

Q.—The reason why I am pressing you a little about this matter is this. You are the first person who has ever indicated to us that Sir George Buchanan ever had in his mind a test at Bombay.

A.—Yes; he did. I know he did want that in the first instance.

Q.—Will you be good enough to go through the files of your correspondence and to write a letter to Mr. Ewbank, the Secretary, to tell him whether or not you have in your office any contemporary written record of that request?

A.—Yes; I will with pleasure.*

Q.—Thank you very much. Did Sir George Buchanan press very hard for a test at Bombay?

A.—Well, I do not know about pressing very hard, but he was told very definitely that he could not get it, in any case.

Q.—Who told him that?

A.—Mr. William Brown, our Chairman, told him at Renfrew.

Q.—Were you present?

A.—Yes; I was. There were six people present.

Q.—You were present at some interview subsequent to the letter of the 25th July?

A.—That is right.

Q.—That is the first we have heard about that. What date was that interview?

A.—Sir George Buchanan was at Renfrew, but the date is omitted here; but we can find that out. It is some time between the 25th July, 1919, and the 12th September, 1919, when we submitted a tender to Sir George Buchanan. It was almost immediately after the 25th July—probably the beginning of August, or something like that; but I will get you the exact date if you like.

Q.—That is near enough. You say there was an interview at which you were present?

A.—I was.

Q.—And Sir George Buchanan?

A.—Yes.

Q.—Who else?

A.—I think the late Colonel Walter Brown was there, and our Chairman, Mr. William Brown, and the whole of the staff—six or seven people were there.

Q.—I would like you to tell me their names as far as you can remember them?

A.—There was Mr. John Stephens, I think Mr. Macgregor was there—I am almost certain Mr. Macgregor was there—and I think Mr. Andrew Brown was there; I do not

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* See Mr. McMurray's letter of October 9th, 1926. Appendix IV.

know whether Mr. John Brown was there or not; I think Mr. Gray, our Secretary, was there.

Q.—Did you forward the letter of the 25th July to your firm at Renfrew?

A.—Yes, they got that letter rightaway. They got it either by hand from me, or it was sent with an accompanying letter—one or the other.

Q.—Can you understand Sir George Buchanan re-opening, at what we will call the August interview, this question when on the 25th July he had written to you: "I shall be satisfied with the test in this country"?

A.—Yes. He has explained to Mr. Brown that he had discussed this with Mr. McMurray, and Mr. McMurray was against any trial in Bombay, or something of that sort was said, that he thought he would be against any trial. It would open in that way. I cannot say definitely that it did, but it seems to me that it is quite likely that it did. That was in 1919 we are speaking of.

Q.—A quarter of an hour ago you told me that he left your office in London saying that he would discuss the matter?

A.—The whole matter.

Q.—With the Renfrew people?

A.—Yes, and so he did.

Q.—Again I ask you can you understand his writing to you within 48 hours that he would be satisfied with a test in this country?

A.—I presume that he really wanted to get that, and when I said I was afraid we would not have anything to do with it, then he wrote this under the impression that he would not get anything more so far as that was concerned.

Q.—Did he at the interview at Renfrew make a definite request that the dredger should be tested at Bombay?

A.—Well, so far as my recollection goes I do not know the words he put it in, but I do know Mr. William Brown told him very definitely that he would not have anything to do with any guarantee or trials at Bombay.

Q.—Is Mr. William Brown available?

A.—I believe he is.

Q.—Where is he at the present moment?

A.—I think he is in Glasgow at the present moment. He has been trying to recruit his health round on the East Coast somewhere. He is an elderly man.

Q.—In the ordinary routine practice of the Renfrew office would somebody make a note of the interview. The Secretary was present, was he not?

A.—Yes.

Q.—Whilst the interview was going on the Secretary would note down the particulars, would he not?

A.—No, he did not.

Q.—After the interview had concluded would it be the duty of the Secretary to make a record of the interview?

A.—No.

Q.—It would not?

A.—No.

Q.—Have you ever seen in the records of the Renfrew office any statement in writing that Sir George Buchanan at that interview in August mentioned his desire that the dredger should be tested in Bombay?

A.—No.

Q.—The position was this, was it not? Your firm could have given two alternative figures. They could have said: "We will build the 'Sir George Lloyd' and the 'Colaba' and supply the requisite plant for £850,000, tests on the Clyde." That is one offer, is it not?

A.—Yes.

Q.—Or they could have said: "We will build the 'Sir George Lloyd' and the 'Colaba' and supply the necessary plant, tested at Bombay, for £900,000"?

A.—Quite so.

Q.—Did Sir George Buchanan ever ask for an alternative offer?

A.—No. I suppose the fact that he was told that we would not undertake a trial at Bombay prevented him from asking that.

Q.—Sir John Biles was giving evidence the other day, and he was being asked by the Committee whether there should not have been a test at Bombay?

A.—Yes.

Q.—If Sir George Buchanan had made the request is not it extraordinary that Sir John Biles did not appear to know anything about it?

A.—I do not know that I can say whether it is extraordinary or not, really.

Q.—Let us examine it a little. Sir John Biles was associated with Sir George Buchanan, and each was to share the half of 2 per cent. Did you know that?

A.—I have only known that now through it being told me the other day.

Q.—That was so?

A.—I was told about it, but I did not know.

Q.—Sir John Biles is the naval architect?

A.—Yes.

Q.—Sir John Biles and Sir George Buchanan, in collaboration possibly with some assistance from your firm, were to get out the designs of a dredger adequate to do this work?

A.—Yes.

Q.—One of the important matters for which they had to provide was a test of the dredger, was it not?

A.—I should say that they had a test of the dredger.

Q.—You are not following my question. One of the important matters that Sir John Biles and Sir George Buchanan would have to decide between themselves would be as to the tests which the dredger should undergo?

A.—That is quite right.

Q.—We are quite agreed about this matter, I think. A very important consideration would be whether the dredger was to be tested on the Clyde or whether the dredger was to be tested, as were the " Kalu " and the " Jinga," at Bombay?

A.—That they would determine in their own mind.

Q.—Undoubtedly. Now we come to the point. If there ever was such a conversation as you have put with regard to Sir George Buchanan asking for a test at Bombay, must not he in his conversations with Sir John Biles have told him about that matter?

A.—That is a thing I do not know anything about.

Q.—I am asking you as an ordinary reasonable man. Two men are sitting down to decide where £850,000 worth of plant shall be tested, and the question is the Clyde or Bombay. Is not it perfectly certain as a reasonable business proposition that Sir George Buchanan would have told Sir John Biles : " I tried to get a test at Bombay, and the Renfrew firm and Mr. McMurray turned it down "?

A.—You know as well as I do that I cannot be certain of anything they did. I do not know anything at all about what they said or did to each other.

Q.—I am not asking you what you knew. I am asking is not it as morally certain as anything can be that this question of a test in Bombay must have been discussed between Sir John Biles and Sir George Buchanan if what you are stating is the fact, that Sir George Buchanan wished to test the dredger in Bombay?

A.—I should think it is very likely that they spoke about it. I should think it is in that way, but I do not know whether they did or whether they did not.

Q.—I am not asking you if you know. This letter of the 25th July, from its first paragraph, is clearly the first letter that Sir George Buchanan wrote to your Renfrew people?

A.—Absolutely, about this. That is the beginning of this thing so far as we are concerned.

Q.—" I have been asked by the Government of Bombay to report on the proposed Back Bay Reclamation Scheme, and I shall be obliged if you will give me an estimate accompanied by plans for the dredging plant required. I have already had the advantage of discussing the matter with Mr. McMurray and I think we are in general agreement as to the type of plant necessary." This letter contains no indication whatever that Sir George Buchanan had ever made a request to you that the dredger should be tested in Bombay?

A.—None whatever, so far as I know.

Q.—If he was going, as you say, to discuss the matter with your firm at Renfrew, would not you have expected him in this letter to say that he had put the request before you that the dredger should be tested in Bombay and you had demurred to it?

A.—Well, I do not know that he would. I had not a very strong word in saying whether the firm would or would not. I had no final decision as to whether they would or would not.

Q.—Then the more open it was left for the decision of your Renfrew firm the less reason there is for Sir George Buchanan to say : " I should be satisfied with a test in this country "?

A.—Yes, on that line of argument it is.

Q.—It is quite right, is it not?
A.—Yes.

Q.—What I am putting to you broadly is that does it not strike one as improbable that he had ever made that request to you, when you consider the terms of this letter of the 25th July. You see the point?

A.—Yes, I see the point you are making now. I did not know what you were driving at before. As I explained in the first instance, I have tried to recollect to the best of my ability, and I feel pretty certain that he did say that, and I told him that we could not agree to such a thing. That is my humble belief at the present moment.

Q.—We know from other documents that the first interview that Sir John Biles the Naval Architect had with Sir George Buchanan was on the 16th April, 1920?
A.—Yes.

Q.—By this letter Sir George Buchanan, acting alone, had to a large extent bound himself to be satisfied with a test in this country, had he not?
A.—I did not quite catch the question.

Q.—By this letter of 25th July Sir George Buchanan, acting alone, not in conjunction with Sir John Biles, had told you that he would be satisfied with a test in this country?
A.—The evidence is there.

Q.—It is there?
A.—Yes.

Q.—I only want to emphasise it. Therefore it would have made the position more difficult for Sir John Biles if later he had said : " I will not be satisfied with anything except a test in Bombay "?
A.—Yes, I suppose it would.

Q.—Have you seen Sir George Buchanan in the past few weeks?
A.—Yes, I saw him in the street the other day.

Q.—Have you seen him to talk to?
A.—Yes, I have spoken to him in the street.

Q.—Have you talked to him about the evidence in this matter?
A.—Naturally he spoke about it, this and the newspaper reports of the thing, and one thing and another like that.

Q.—Apart from meeting him in the street, have you been to his office or has he been to your office about this Inquiry?
A.—I have not been to his office about this Inquiry.

Q.—Has he been to yours?
A.—He called one day when I was out.

Q.—Have you seen Mr. Halcrow?
A.—I have seen Mr. Halcrow several times about other work.

Q.—Did you give Sir George Buchanan some sort of general outline of the evidence you were prepared to give?
A.—None whatever. We found great difficulty in writing anything because we did not know in what way our evidence was wanted. There are all these documents. They are recording the actual facts and it seemed to be rather difficult to find out what might be of use to the Committee. That is the reason for the short answers.

Q.—The short answers are sufficient for our purpose. The only quarrel I had with you yesterday was your answer to Question 18?
A.—Yes.

Q.—You rather stuck at the word " guarantee "?
A.—Yes, I hope that is made clear now.

Q.—Now I point out to you that in that letter of 25th July Sir George Buchanan used that very word. Would you turn to it. " I shall be satisfied with a test in this country and your guarantee that the plant will do the work required." There is the word, is it not?
A.—That is so.

Q.—On the 12th September, 1919, your firm wrote a letter which was in answer to the one of the 25th July?
A.—That is right.

Q.—Will you turn to that part of the letter which suggests the terms of payment, the scheme of instalments. You see 20 per cent., 20 per cent., and so on?
A.—Yes.

Q.—" 10 per cent. at the expiry of the three month's period of guarantee "?
A.—Yes. We had then a three months period of guarantee against defective workmanship and materials.

Q.—I follow your point.

A.—We have always had a guarantee against that.

Q.—You say that the word " guarantee " there is limited to defective workmanship and materials?

A.—Absolutely.

Q.—But it does not do away with the fact that at the outset of this letter the rotary-cutter suction dredger was described as designed for dredging to depths up to 70 feet below water level and to be capable of discharging at the rate of 2,000 cubic yards of soft clay per hour through a floating pipe-line to a distance of 5,000 feet?

A.—I think that is practically the same as what is put in the specification.

Q.—It is. The word " guarantee " in the document which has been handed to me you limit to workmanship and materials?

A.—Absolutely.

Q.—But the letter says: " and your guarantee that the plant will do the work required "?

A.—That is right. That is what Sir George Buchanan put in his letter to us.

Q.—I do not think I need ask you anything further on that because we have your evidence on record yesterday with regard to that particular passage. Sir Lawless Hepper, who is the Director of Development, has given us a preliminary statement. I do not suppose you happen to have seen that?

A.—I have seen nothing at all except these odd newspaper reports—nothing whatever. I have had no evidence given to me until this thing started here.

Q.—Sir Lawless Hepper made a very great point of this. He showed that in the specification all that you were required to design was a dredger capable of dealing with soft clay?

A.—That is so. According to our contract that is the sole point.

Q.—The point Sir Lawless Hepper made was this. He referred to the report of Lowther & Kidd of 1912 and he called our attention to this, that Mr. Kidd spoke of the clay as being " stiff and unctuous." He also called our attention to Sir George Buchanan's own report, in which he spoke of the clay in the harbour as being " hard." I want you to keep those three descriptions in mind for the moment. First your own specification of a dredger designed to work in soft clay?

A.—Yes.

Q.—Next the statement of Mr. Kidd that as a result of some 1,159 recorded borings he found the clay to be stiff.

A.—Yes.

Q.—Always a bed of mud superimposed upon what he described as " stiff clay "?

A.—Yes.

Q.—Then the statement of Sir George Buchanan himself that the clay was hard. Those are the three facts I want you to keep in your mind. A firm of dredger builders might, I suppose, build an excellent dredger designed for soft clay which would not give or might not give satisfactory results in stiff, hard clay?

A.—That is right. It might not be able to dredge it at all.

Q.—It is a question of degree?

A.—Absolutely.

Q.—If a dredger designed to work in soft clay was put to work on stiff or hard clay, while she might be able to cut it, you would not expect the same output as if she were working in soft clay?

A.—Certainly not.

Q.—Do you happen to know how the description " soft clay " got into the specification?

A.—Well, I know we put it in the original specification. You see from this letter of Sir George Buchanan he speaks about it as " clay," if my recollection is aright.

Q.—The letter of the 25th July, 1919?

A.—Yes.

Q.—" The dredger must work to a depth of 70 feet and have a minimum capacity of 2,000 cubic yards of clay per hour discharging through the whole length of the pipe-line."

A.—That is the first proposal he put to us. Our tender is " soft clay," not " clay."

Q.—Sir George Buchanan having referred to " clay " in the letter of July 25th, your firm's letter in reply of the 12th September uses the phrase " soft clay "?

A.—That is quite true. We did that. I will tell you the reason if you wish to know.

Q.—I will put a question or two for a moment. Therefore I suppose the contention of your firm is that you having contracted to design a dredger for working in soft clay, that is the limit of your responsibility?

A.—Absolutely, so far as that is concerned. We give that output in soft clay, not harder material.

Q.—We know that there has been a very great failure of output in the dredging operations—I am not using the phrase, failure of the dredger?

A.—I observe that, thank you.

Q.—It is a failure of output in the dredging operations. As an expert will you give me your view of the various causes. Let us have them one after the other.

A.—I think the first and most important is this question of the material. That is the first and most important thing of the whole lot.

Q.—A dredger designed for soft clay is put to work in stiff clay—is that the point?

A.—Taking everything right down to the rock, as far as I understand it, or moorum.

Q.—That is your first point?

A.—Yes.

Q.—That means unsuitability of material for the work the dredger was designed to do—is that it?

A.—I am not quite clear if that is truly correct.

Q.—Then put it in your own way?

A.—The dredger has been designed for this output in soft clay. She will take anything that is in the harbour, practically speaking, down to the rock, at a very much less rate according as it differs in consistency and hardness.

Q.—Is that right?

A.—That is the whole thing.

Q.—That in itself would be one cause for a greatly diminished output?

A.—Absolutely.

Q.—You will forgive me putting several questions on the same point but I want to get it clear beyond doubt. Does any other cause occur to you?

A.—Well, I have only seen this vessel working for a short time at the beginning when she started working there and I have not seen her since unfortunately. I had intended seeing her, but through illness I have not been out there these last two cold weathers, otherwise I should have been out every cold weather having a look at the boat and seeing anything that I thought I ought to see or hearing what they had got to say about it and speaking with them over it. But it seemed to me when I saw it starting first there, that they did not have quite enough supervision for the work. When I spoke to one of the men who was in charge there, looking after it, about not having this thing more or less looked after properly, he rather complained at the time that he had most of his time taken up in the office filling up forms. Well, that is all very well, but I said at the time: "Look here, this is a powerful, big plant, and a man who is going to look after this will have to be on this plant morning, noon and night. You cannot sit in the office and look after a plant of this kind. You cannot do it in a motor car and you cannot do it by sitting in an office or anywhere else." He has to be on the plant morning, noon and night, going all over the place, if he is supervising this plant properly. That is what I said at the time. I do not know how far that position was altered after I left, but I did think at that time they did not have such efficient supervision as they might have and as they ought to have. That is what I think. The man tells me that a lot of his time was taken up with office work and he had not time to go round all the plant all the time as he must be in the office to do all these things. Well, I take his word for it.

Q.—When you say "a man," do you happen to know who he was?

A.—Mr. Brims.

Q.—The actual dredging master was nominated by your firm, was he not?

A.—That is right.

Q.—Mr. Spiers has given evidence, and he says that as dredging master he was in charge morning, noon and night.

A.—Yes; I believe that is so. He probably was as dredging master.

Q.—Had you confidence in Mr. Spiers?

A.—Yes; I think Mr. Spiers is a very good dredging master.

Q.—A very good dredging master is a man who can get results?

A.—That is so.

Q.—That is what you want him for?

A.—Yes. The term "dredging master" may be a little unfortunate. He is really the dredger operator sent out by Simons and Company.

Q.—But he was the man who was to take control of the dredging operations?
A.—Of the dredger.

Q.—Of the dredger?
A.—Of the dredger alone.

Q.—The dredger?
A.—The dredger alone, and nothing else.

Q.—Surely he was the man who was directing the dredging operations?
A.—On the dredger; the dredger itself. He had nothing to do, in the first instance, as far as I know, with the pipe line, or anything of that sort.

Q.—He was in charge of the dredging operations?
A.—The actual dredging.

Q.—And in charge of the "Colaba" when she was acting as the intermediate pumping station?
A.—Our view was that he ought to be in charge of the "Colaba." Whether he was, or whether he was not, I do not know. He ought to be in charge of the "Colaba," and he ought to intimate to the man on the "Colaba" when he wanted him to work and when he wanted him to stop.

Q.—I am putting to you the position of Mr. Spiers was that, being sent out with the approval of your firm, he was the actual dredging master, and a very good dredging master, too.
A.—I should say so.

Q.—Is there any other cause which you can suggest?
A.—Yes; I think one rather important cause is that in all these dredging problems they ought to pay the men on some system of output.

Q.—Some system of bonus for output?
A.—I think so. It is not a very nice climate. It is a worrying job working on a dredger that is rattling away morning, noon, and night, and that sort of thing. If they have only got fixed pay there is very little incentive to excel themselves in anything. I think every contractor has found that they get much more work out of the men and the machine if they are put on some system of bonus on the results obtained.

Q.—Does any other cause occur to you for the low output of the dredging operations?
A.—Are you speaking of the low output per hour or for the whole time, because you see the difference?

Q.—She started working on December 8th, 1923, and she want on till the monsoon. The history is that instead of pumping 2,000 cubic yards per hour, she did 1,020.
A.—That is the average, is it?

Q.—Yes; that is 50 per cent. The next year she did 856 instead of 2,000.
A.—I cannot contradict those figures because I have not all the operations.

Q.—I am not asking you to contradict the figures. I am asking you if you can help us to say what was the cause of the undoubtedly low output of the dredging operations?
A.—Well, I have given you three reasons.

Q.—Does anything else occur to you?
A.—I do not know that it does at the moment.

Q.—You have given us three reasons. A fourth one might be the insufficiency of material as apart from its consistency being stiff and hard?
A.—I see what you mean.

Q.—Those are matters which have to be examined into?
A.—Quite so.

Q.—Unless you get a good depth of material it is uneconomical working a dredger like the "Sir George Lloyd" because you cannot get your results?
A.—No; you must get a fair depth of material to work on.

Q.—The last point, the actual failure of the dredger "Sir George Lloyd" even to deliver soft clay to the extent of 2,000 cubic yards per hour is a possibility which you have rejected. You maintain that the "Sir George Lloyd" when delivered was a vessel perfectly capable of delivering 2,000 cubic yards of soft clay per hour through a pipe line 5,000 feet in length?
A.—That is the position.

Q.—Then about the "Colaba." The "Colaba" has given a good deal of trouble, as I daresay you know, with regard to vibration.
A.—Yes; I believe she has.

Q.—Sir John Biles said in his report when tests were taking place that at the lower speeds there was no vibration whatever, but at the upper speeds it was observable, but

not to any serious extent. That is one reference. Then when the vessel was steaming full speed astern there was considerable vibration; but that is not very unusual, he says.

A.—No.

Q.—Then he says he can give no satisfactory explanation of the vibration on the "Colaba." You have seen her, of course?

A.—I have not seen her at work.

Q.—You saw her?

A.—Yes; but not at work.

Q.—Can you give any satisfactory explanation of the vibration?

A.—I am afraid I cannot. The vibration seems to have rather puzzled everybody. You see, the vessel is relatively stiffer than the "Sir George Lloyd." She is a much shorter boat. She has got the same depth, and that sort of thing. They do not have the same trouble in the "Sir George Lloyd."

Q.—We called Captain Phillips, of the Royal Indian Marine. He had reported on the "Colaba," and he explains that examination of the engine seating and bed plate showed that a number of rivets, all securing angle brackets, had worked loose, which permitted considerable vertical movement of the engine, which was a serious defect which could develop to a dangerous extent, due to the excessive vibration which is set up. When asked if he could account for the cause he said this: He was asked if the movement which he spoke of in a main pump was a serious matter, and he said it was: "and unless cured would have very serious consequences?—(A.) Yes. (Q.) What do you think the vibration is caused by?—(A.) My personal opinion is that the pumping engine should have been amidships in the centre of the fore and aft displacement." What do you say to that?

A.—I do not think there is anything in that point at all. That is my opinion.

Q.—In point of fact, the pumping engine is not in the centre of the fore and aft displacement of the "Colaba." It is on one side.

A.—Is *not* it in the centre line of the ship? If my recollection is right, it is.

Q.—But not in the centre of the fore and aft displacement?

A.—No; it is not. The boilers are. So far as I recollect, we nearly always try to put the boilers in the centre because of the draft and the loading bunkers and the coal bunkers. It is better not to have the bunkers at one end. They trim it up and down.

Q.—If Captain Phillips' view is right, that is a structural defect which cannot be remedied?

A.—Yes; but I do not think there is any possibility of its being right. We have built so many dredgers that I do not think there is any possibility of that being right.

Q.—Will you just bear in mind your promise to go through your files in the office and see if you can produce any letter written by your firm stating that Sir George Buchanan made a request to have the vessel tested in Bombay?

A.—I will, with pleasure.

Q.—And also if you have got any written note—any contemporary written evidence?

A.—Yes.

Sir M. Visvesvaraya.—You have given several reasons for the failure of the dredger to give the required output?

A.—I have given some suggestions.

Q.—Now that things have gone wrong, whatever the reason may be, and the dredger is giving less than 50 per cent. of what was promised, what remedies do you suggest to improve its working efficiency?

A.—I would not give any remedy at all until I found out what was the exact position.

Q.—You have not attempted to find out the exact position?

A.—We have not had an opportunity. There has been nobody out there to look into the matter and see for themselves.

Q.—Did the Bombay authorities approach you in the matter?

A.—My recollection is that they did through Sir George Buchanan, and we offered to send somebody out there, I think. There has always been this sort of thing, that these records that were given might not be correct.

Q.—The records that were given of the output of the dredger?

A.—Yes. It seems a very strange thing that at the end of May when the "Sir George Lloyd" is working all by herself she is delivering through 6,000 odd feet of pipe, or something of that sort; and according to the figures that we got home from the dredging master and chief engineer on the boat, she was then doing over 1,700 yards an hour. That is the last week in May, or something like that, just before the monsoon after she started. Then there has always been the suggestion that there may have been a big loss of material, of softer stuff before they backed it in to prevent it from going out into Back Bay.

Q.—That happened in two seasons.

A.—Are those figures all correct? Does it show what loss they had, or anything of that sort?

Chairman.—The figures I gave you of 1,020 and 856 were figures ascertained by the soundings taken immediately after the dredging, not the amount deposited in the reclaimed area.

A.—I see.

Q.—I have not dealt with the figures of loss.

A.—Quite so.

Sir M. Visvesvaraya.—You cannot place dependence on the records given to you, so you cannot suggest any remedy?

A.—I will qualify that now in view of what the Chairman says. He says that those records are the records in excavation.

Chairman.—That is right.

A.—Of course we must accept those records.

Sir M. Visvesvaraya.—Have you any remedies to suggest now? You have now clearly stated what the faults were or what was wrong with the operation. Have you any remedies to suggest to improve matters?

A.—No; I do not know that we have any remedies to suggest. If it is the fact that it is the material that is wrong, if it is very substantially wrong, and the material is so stiff that we could not possibly hope to get 2,000 cubic yards, then there is very little that can be done. I do not think you will alter the dredger much to get much more output from her.

Q.—You cannot alter the dredger?

A.—Not very much. You can alter and improve her—you can improve everything, but I do not think you will get 100 per cent. improvement.

Q.—You might improve it to some extent?

A.—Yes; but I do not think you will get 100 per cent. improvement, or any possibility of getting anywhere near that.

Q.—Would not an improvement in the blades of the cutter do some good?

A.—It would not do very much good, but it would be a simple thing for them to try half a dozen cutters if they liked. It does not take long to remove one and put another on.

Q.—You were going to explain to the Chairman why you put in the words " soft clay " in the tender, or in the agreement. Would you do that now?

A.—Yes. " Clay " seemed to us to be a very indefinite term; it might be soft or stiff or hard or anything. We must reasonably expect to have some more concrete definition of the consistency of the material. We put it as soft clay, and we said at the time that this dredger, as designed, would cut, practically speaking, all the kinds of clay there are in the harbour there. It would not dig rock, but it would dig the different kinds of clay at different capacities.

Q.—The capacity would alter?

A.—Absolutely. It would go smaller as the material got stiffer.

Q.—Did you happen to read Sir George Buchanan's printed report?

A.—Report on what?

Q.—On the reclamation scheme?

A.—No, I never saw it.

Q.—Were not all the local circumstances communicated to you, together with an account of the reclamation work proposed?

A.—No. We never received any report of Sir George Buchanan.

Q.—Did you ask for it in order to keep yourselves informed of the circumstances under which your dredger had to work?

A.—No, we did not.

Q.—You did not think it worth while?

A.—We have never in our lives asked for an engineer's report of any scheme.

Q.—Did you ever advise the working of the dredger in three shifts?

A.—No. I never advised it working in three shifts. I would have liked very much to have done it, if it had been possible, but I always observed the very likely difficulty in working three shifts there.

Q.—What was the difficulty?

A.—As originally arranged, I believe it was 15 hours a day in two shifts. That left nine hours clear for moving anchors or wires, or anything else; that is to say, they were really going to make use of the 24 hours somehow or other, but with the actual shifts, having a full and complete crew on for duty, there would only be the 15 hours worked.

They would be working more than 7½ hours each. and they might work a little overtime where necessary. At any rate, it left about 60 per cent. for working time.

Q.—For pumping?

A.—No, there were 15 hours out of the 24, which left 9 to take the opportunity of filling up losses of time, as it were, laying out moorings, or shifting wires, or something of that sort. We could not expect to pump the whole 24 hours throughout the day.

Q.—You would be pumping throughout the 24 hours, but leaving intervals for shifting and for other arrangements?

A.—The idea was to aim at doing 15 hours' actual dredging work. For the rest of the 9 hours they did what they liked in the way of shifting moorings and anchors; and if they had had some delay in the middle of a shift, and they wanted to try and make it up, they would make it up then.

Q.—I understood that at night time they did not work, even if they could do so?

A.—There is a good deal more difficulty in working a big powerful suction dredger like that in the night time than there is in working a bucket dredger. My view was that they should start at the first sign of daylight and work right through the daylight hours into the night in order to make up 15 hours. I thought that that was a very good arrangement, because it is very much easier working into the darkness than it is starting in the darkness. Daylight is very much better for operations of that kind than the night time. A bucket dredger is absolutely different.

Q.—Several dredger contractors who have done dredging work say that three shifts are absolutely necessary in order to save the interest on capital.

A.—Everybody would like to work as many shifts as they could. They would like to work the whole 24 hours of the day in order to save interest on the capital if they could. That is the whole point. If it is possible to do it, then it should certainly be done.

Q.—Would you not have consented to guarantee tests at site if you had been offered a higher price?

A.—No.

Q.—Why were you so determined in this case ?

A.—What on earth could we have put in as a price? If we had been given an area to dredge upon there we might have had all kinds of obstructions and delays during the trial.

Q.—But your own firm had experience in the case of the " Kalu " and " Jinga "?

A.—Yes; that is one of the reasons.

Q.—You tested those two dredgers in Bombay?

A.—We did.

Q.—Then why did you make an exception in this case?

A.—I think I said yesterday that when the scheme was first discussed with us everybody seemed to think the material there was very soft. I believe, as a matter of fact in one instance they thought they would not need a cutter for a good deal of the material, and that it was all very easy and simple dredging. When we dredged at Bombay we had to dredge first of all for the trenches for the walls. We had to dredge down to hard, and to take everything which was coming in our way. On the top of that there were spread all over that area huge quarried stones, which I suppose had been dropped out of the country boats. We could not do anything else but pick them up. They were lying there. Sometimes we would get them on the top of the mud, or a few feet below it, or down at the bottom. Those things had to pass through the pipe.

Q.—Did you take any special steps to keep yourself informed whether or not the plant was working satisfactorily, or, in other words, was doing its job?

A.—We got the dredging master and the chief engineer to fill up and send us every week a form which we have for telling us what the dredger is doing, and they did that, I think, for the whole of the first season.

Q.—Were you sending to Bombay weekly any comments or advice on such reports as you received?

A.—Not with regard to the output of the dredger; only with regard to little things. One was a beastly little water pump which gave some trouble. Eventually we took it out and put in another one.

Q.—Mechanical details?

A.—Yes.

Q.—When you manufactured the plant, did you feel quite sure that it would do its work?

A.—We felt quite sure that it would do its work in soft clay, and also that it would dredge practically all the stuff in Bombay harbour, except the rock, but at a very much lower rate according as the stuff got stiffer.

Q.—Were you confident it would do its appointed task; that is the point?

A.—The specified task, yes—2,000 yards of soft clay an hour through 5,000 feet of pipe.

Q.—You were sure that in clay of any kind it could do 2,000 cubic yards as a regular average?

A.—No, not at all.

Q.—You said so yourself?

A.—As the material grew harder it would be less. In some of that very hard clay at the bottom it would not do 500 yards an hour.

Q.—But on the average, it would do 2,000 cubic yards?

A.—Not on the average of all the stuff in the harbour, no; only on the soft clay.

Q.—You say if it were only soft clay. The soft clay was on the surface. How did you expect it would do 2,000 cubic yards per hour?

A.—The soft clay is below the mud, as far as I understand it.

Q.—You did expect hard clay, and you did expect that in hard clay the output would be smaller?

A.—Absolutely.

Q.—On an average you expected 2,000 cubic yards per hour?

A.—Not that average on all the material.

Chairman.—You assume, Sir Mokshagundum, that this witness expected hard clay. From where do you get that? I do not know. He specified for soft clay. You must bear that in mind.

Sir M. Visvesvaraya.—He specified for soft clay, and he said he expected there would be stiffer clay and then the output would be smaller. He said that in reply to you.

Witness.—I said the output would be smaller in stiffer clay or in hard clay.

Q.—On an average you did not expect 2,000 cubic yards an hour?

A.—Only on the soft clay.

Q.—In Sir George Buchanan's letter which the Chairman read some time ago, it is stated: "The dredger must work to a depth of 70 feet and have a minimum capacity of 2,000 cubic yards." Minimum capacity is mentioned there?

A.—Yes, that is right, in soft clay.

Q.—As the Chairman has pointed out, one of the statements in Sir George Buchanan's letter to you is that you guaranteed the plant would do the work required?

A.—That is what he said he would be satisfied with.

Q.—He wanted your guarantee at the time to do the work required?

A.—Quite right. He never got any guarantee from us except this thing about the soft clay

Q.—Was there any room for doubt that you intended to give a serviceable plant?

A.—I do not think so.

Q.—Then when you accepted the specification, were you not confident that the dredger would perform its appointed task?

A.—That is right—at 2,000 yards of soft clay per hour through 5,000 feet of pipe.

Q.—You are satisfied that it is capable of doing that even now?

A.—Yes.

Q.—Who communicated to you the fact that the dredger was not working satisfactorily—the first time?

A.—I think it was Meik and Buchanan.

Q.—Is it not usual, when you accept an order of this magnitude, to examine the material which the dredger has to work upon?

A.—No, I would not say it was usual.

Q.—It was a very big order—perhaps one of the biggest orders you have had. I understand it is the usual thing among dredger builders to examine the material which the dredger has to work upon?

A.—It often happens that we get samples of material sent home to us, but by the time they reach us it is very difficult to say what the thing was like when it came out of its bed. It gets dried up and is in quite a different state from what it was on the site.

Q.—Are not careful studies and tests made on this point before preparing specifications?

A.—By whom?

Q.—In the case of such a dredger as this, by the engineers or by the builders?

A.—The builders quote for what they are asked to quote for, if they can do it. If they cannot do it, then they say they will do something else.

Q.—Is it usual for a manufacturer to accept a specification to which he is not able to conform?

A.—I do not know that we ever do that.

Q.—If you do not examine the material, as has not been done in this case, do not you think there is a risk of the dredger not doing its work?

A.—We stated quite clearly in our tender that the capacity of the dredger would be measured by the standpoint of 2,000 yards an hour of soft clay through 5,000 feet of pipe.

Q.—Usually, when a design is prepared for a dredger, do not the engineers partly depend upon the manufacturers for their data and for their advice?

A.—Not usually. We get any number of engineers who give us designs and specifications for a dredger.

Q.—But, from your experience you suggest to them many details, do you not?

A.—We oftentimes suggest details to them.

Q.—You are as much interested as they are in seeing that the article you give is serviceable?

A.—We always are very anxious to see that everything we build is a success.

Q.—The principal has a moral claim on you for a serviceable article, has he not?

A.—The contract was to construct a vessel of certain dimensions, size and power.

Q.—To do a certain job; to give a certain output. That is more important than anything else?

A.—It says it is to be capable of doing 2,000 yards an hour of soft clay and, in our humble opinion, the vessel is capable of so doing.

Chairman.—She was to be capable of dredging 2,000 cubic yards of soft clay per hour?

A.—That is all. That is what is put in the specification for the vessel. The dimensions and everything else are there. We tendered for that, and we built it according to that. In the first instance we ourselves put forward a specification and design with our tender showing what it was we offered, and what was the capacity of the vessel, and the price. We did that.

Sir M. Visvesvaraya.—You are not responsible for the soft clay, and you are not responsible for not testing in Bombay?

A.—I do not quite know what you mean by " not responsible for the soft clay "?

Q.—You did not suggest these conditions yourselves?

A.—We put forward the condition of soft clay.

Chairman.—Messrs. Simons were the people who first used the words " soft clay," and the position this witness takes up is, " We contracted to build a dredger that would dredge in soft clay, and we have done it. If you put the dredger on to dealing with something which is not soft clay, that is your own look out." (*To the Witness*): That is the way you put it, is it not?

A.—Yes.

Sir M. Visvesvaraya.—Was there any disagreement between you and the staff on the spot?

A.—No.

Q.—Or between you and Sir George Buchanan at any time?

A.—I do not know there was ever any disagreement at all about the point.

Q.—Not even in Bombay, when you visited the place?

A.—In Bombay everybody seemed to be rather pleased at getting such good stuff. What they called good stuff was good, stiff clay. They had been rather afraid that they would be obliged to fill this reclamation with slurry, and that sort of thing.

Sir Frederick Hopkinson.—You told us yesterday that you had been asked to build a dredger and guarantee its working for twelve months, paying all expenses; and you said also that you were poor dredger builders and that only rich contractors could afford to do that sort of thing. That is so, is it not?

A.—I believe I did use that expression.

Q.—I want to look at the measure of your poverty. In 1918-1919 and in 1922 your Company paid 20 per cent. dividend free of tax, did it not?

A.—Yes.

Q.—In 1922-23 it paid 20 per cent. again. In 1923-24 it paid 10 per cent., a cash bonus of 2½ per cent. and a capitalised bonus of 33⅓ per cent. In 1924-25 it paid 10 per cent. I may take that as the measure of your poverty?

A.—Yes, you may take that, Sir.

Q.—Can you tell me when the profits of this dredging plant for Back Bay were brought into your balance sheet?

A.—No, I cannot.

Q.—Do you think it is possible that they were brought into the year when you paid 33⅓ per cent. capitalised bonus?

A.—I could not tell you.

Q.—Is there anyone in the world who ought to know more about the clay in Bombay than your firm?

A.—That is a big question to answer.

Q.—You have built several dredgers for Bombay, have you not?

A.—Yes. We have built quite a number for Bombay.

Q.—Is Mr. William Brown the Managing Director of your Company?

A.—He is the present Chairman.

Q.—I see that in the Proceedings of the Institution of Civil Engineers, Volume 203, he says: "The vessels selected for the purpose of illustration have not been chosen because of any phenomenal dredging done by them, but because they have all had particular attention devoted to their design to meet the conditions of their intended employment"?

A.—Yes.

Q.—On the next page he speaks about the "Silurus," a bucket dredger built by your Company for the Bombay Port Trust, and he says, with regard to the various engineers under whom the "Silurus" was constructed, that their intimate knowledge of the conditions prevailing at Bombay "has been invaluable to the builders in preparing the designs"?

A.—Yes.

Q.—So that in addition to your own knowledge you have the knowledge of all those engineers?

A.—That is right—the Bombay engineers.

Q.—You also built a powerful bucket barge loading dredger, the "Octopus" for Bombay?

A.—We did.

Q.—Mr. William Brown goes on to say: "These dredgers give satisfactory results in all kinds of clay, as well as in free material, and on occasion cutter dredgers have been employed on stiff blue clay and on hard chalk, which have been found to test severely the capabilities of powerful bucket dredgers. In the case of a cutter dredger owned by the Admiralty, it was found that the results obtained in stiff blue clay and in chalk were quite double the quantities that had been raised by powerful bucket dredgers." So there is nothing new about a cutter dealing with stiff blue clay, is there?

A.—Nothing whatever, as far as that goes.

Q.—Then two pages further on he says "The system of dredging decided upon"—this was for somewhere near Rangoon on the Twante Canal—"was the employment of suction cutter dredgers to cut the hard clay that formed the bank and bed of the canal, suck up the material thus disintegrated, and pump it through a floating pipe line to alongside of wherever it was desirable to deposit it upon the bank." Then a page further on he says "The averages for the last year in cubic yards per hour are: "Oswald," 845; "Campbell," 1430; "Lees," 1480; these comparing favourably with the guarantee specifications of 780, 780 and 1200 respectively." In the case of the "Campbell," she apparently gave double what she was guaranteed to give. So there apparently was a case where you did give a guarantee?

A.—Oh, yes. We have given many guarantees.

Q.—You built the "Jinga" and the "Kalu," and you gave a guarantee there?

A.—We did.

Q.—It has been shown that in the one case the dredger, working under ordinary working conditions, only gave 50 per cent. of its output; and in the other case the other dredger gave 70 per cent.

A.—That is the average, I believe.

Q.—The average under ordinary working conditions?

A.—The whole time they were working there.

Q.—Yes. Would you consider that a satisfactory output?

A.—I do not know that I would consider it quite satisfactory in the one case. The one ought to have done as much as the other, very nearly—unless there was very difficult material in the one case compared with the other

Q.—The material I am told was mostly mud.

A.—Whoever told you that told you an untruth.

Q.—This was finished in 1913, and I believe right up to the present time they still have to put mattresses down before they can lay a railway line on this reclamation?

A.—There are certain spots where it is like a blancmange still. They were filling from the sea side, and they could not properly drain the water out of those beds.

Q.—It would drive the water in front of it?

A.—Yes, and the clay puddled the whole thing so that it could not get back and get out, and it was a question of drainage.

Q.—Are you sure that a large proportion of that material was clay?

A.—I saw it.

Q.—You saw it for how long?

A.—For the whole five years it was there. I was always twice a year in Bombay.

Q.—And you saw it?

A.—And I was there for about six months at the very beginning.

Q.—The test of the "Kalu" and "Jinga" occupied, I believe, 80 pumping hours, did it not?

A.—I think it was something like that.

Q.—During that time, did it do the specified 2,000 yards an hour?

A.—According to the Bombay peoples' own figures——

Q.—I am asking you if it did the specified 2,000 yards an hour?

A.—Yes.

Q.—How was the material measured?

A.—In excavation.

Q.—You are quite sure about that?

A.—Yes.

Q.—Then how do you account for the output falling off? Was this a special crew for the 80 hours?

A.—No.

Q.—Or special coal?

A.—No.

Q.—Or special attention?

A.—I do not know whether you would call it special attention or not.

Q.—Were you there?

A.—Yes, I was there.

Q.—You gave it special attention?

A.—I did. I gave both dredgers special attention. I was starting those vessels to work.

Q.—Did you pay any special bonus for it?

A.—I have always endeavoured to pay the men a bonus.

Q.—I am not complaining about it, but you did on that occasion?

A.—Yes.

Q.—You got the very best out of the dredger which you could get?

A.—I would not say that. It was a clean start. None of the men aboard those dredgers had ever handled a suction cutter dredger before they went on board the "Kalu" and "Jinga."

Q.—But you were there to direct, so that did not matter much, as long as you had plenty of steam and kept your pump running?

A.—We had difficulty in getting going with the bad coal which we had in the first instance.

Q.—Can you tell me what bonus you paid for those 80 pumping hours?

A.—It was just the ordinary bonus which dredging men were paid. I could not tell you the figure offhand.

Q.—You say just the ordinary bonus; but there could not have been any ordinary bonus when the dredger had just started work. This was her trial?

A.—Yes. Oftentimes, when men go abroad, we pay them a bonus when they come back if they work well.

Q.—That is a general remark. You say you did pay a particular bonus in this particular case for this particular work?

A.—Yes, we did.

Q.—Do you know what it was?

A.—I do not know. It was not very much. I think that probably——

Q.—I do not want "probably." That will not help me. Was it a handsome bonus?

A.—I do not know that you would call it a handsome bonus.

Q.—By how much did you exceed the stipulated output of 2,000 yards an hour?

A.—The first trial we had was 2,750 yards an hour.

Q.—That is under special conditions of test. How do you account for the output being so very much lower afterwards, working under ordinary conditions?

A.—It is very difficult for anybody to answer such a question as that. I was not directing operations all over the five years of work.

Q.—But it is unfortunate, because this low output has occurred with three dredgers which you have built for Bombay?

A.—That is right, according to your interpretation of the position.

Q.—Surely your reputation is involved in this, is it not?

A.—Sir, we cannot go until the end of our days running every dredger which we build for every scheme that comes along.

Q.—Just answer my question. You have stipulated that these dredgers would do 2,000 yards an hour under ordinary working conditions. They have all three failed very badly under those conditions Do not you think your reputation suffers a great deal by that?

A.—No. There was not one single one of those three dredgers which was working according to the contract. We were dealing with material that it never was intended we should deal with.

Q.—Stop a moment. Take the " Kalu " and the " Jinga." What was specified for them?

A.—Soft clay.

Q.—You say they did 2,700 yards an hour?

A.—I say they did, and they were dealing with more than soft clay then.

Q.—Then why did not they continue to do it?

A.—I will tell you one reason why. They were putting it all over the place, with pipe-lines of sometimes as much as 5,700 feet instead of 4,500 feet, and there were all kinds of kinks and bends.

Q.—That would only be occasionally?

A.—It was altering all the time.

Q.—Surely there was some straightforward pumping in four years?

A.—It was altering all the time, because they had to go over the whole area.

Q.—But you knew all about that before you built the dredger. You knew the district. You knew what it was called upon to do?

A.—Sir, all we were asked to do was to build this boat with this output and to test it, and we did that output through 4,500 feet of pipe.

Q.—I am asking you to try to explain to the Committee why your three dredgers, which you say have done so magnificently on test, have failed so utterly when they have been called upon to work under ordinary working conditions?

A.—But not under the contract conditions.

Q.—Under the ordinary working conditions. Tell me this. You said just now that the clay varied very much in quality. What experience have you of that?

A.—The actual experience of seeing the clay when it came out of the end of the pipes.

Q.—We had a gentleman here yesterday who told us he had made 1,300 borings there, and that, with the exception of a foot or so at the bottom, the clay was practically homogenous. In addition to making those 1,300 borings, he has seen the " Kalu " and the " Jinga " at work for months; he went into the bottom of the docks at Bombay while they were being made, and he saw the material in bulk; and he says that it is all soft clay—or, rather, his description was " stiff clay." It was so soft that a hand pump —an ordinary semi-rotary pump put on to a 2-inch pipe—would wash the clay away at the bottom of the pipe, and he could sink that pipe through 30 feet of clay. Would you call that hard clay?

A.—No, I would not.

Q.—It is soft clay?

A.—Absolutely.

Q.—Soft clay which you, knowing the conditions in Bombay, specified for your dredger to do?

A.—We did not want to be tied up to do an output at that rate in any other material than soft clay.

Q.—I am suggesting to you that the material, with the exception of a foot at the bottom, was soft clay?

A.—In Bombay?

Q.—In Sewri.

A.—We had all kinds of material.

Q.—I am giving you the experience of a man who has made 1,300 borings and who has seen the clay on many occasions, and who has also been in the bottom of the docks and seen it in bulk?

A.—He told you, I think, he saw the strata of the clay going down.

Q.—He did not say anything of the kind. He said it was practically homogeneous clay.

A.—He told you, I think, that he saw this thing cut right down, and that he saw the different strata right down to the bottom.

Chairman: He saw the mud on top.

Sir Frederick Hopkinson: He saw the mud on top and then the clay. He did not say anything about different qualities and hardnesses of clay.

A.—If he said there was only one hardness of clay at Sewri, then I must contradict it.

Q.—With the exception of a foot at the bottom.

A.—I must contradict him. It is not so.

Q.—The Committee have seen the clay. Whatever the clay was, you knew all about it before you tendered for this dredger, did you not? No one knew better?

A.—I cannot say we knew all about it.

Q.—But you had had two dredgers working at Sewri. You had built bucket dredgers for there. Therefore obviously you must have known all about the clay?

A.—Generally speaking, we took the view that the material would be much the same.

Q.—In a position like that clay does not vary in small areas, does it?

A.—I do not think it is likely that it does vary much in small areas, but I do not agree there was only one consistency of clay there.

Q.—At any rate, whatever it was you knew more about it, or were in a position to know more about it than anybody else, from your long experience of it?

A.—We were in a position to know a good deal about it.

Q.—Therefore you were in a position to provide your dredging pump with sufficient power to deal with it?

A.—Yes. We were in a position to say also that we would only give that capacity in soft clay.

Q.—You knew before you designed the dredger that it was for Bombay, did you not?

A.—We did.

Q.—Therefore you knew the clay, and therefore you were putting your own description on the clay. You called it soft clay, with all your long experience of the clay in Bombay?

A.—Yes, and I think it is quite evident that the object of that was to arrive at a standard of output.

Q.—No, it was not a standard of output. It was to do the actual output on this particular work. The whole work depended upon this output. I say that you have given a definition of the clay, and you decided what your dredger was to do from your knowledge of the clay. Is not that so?

A.—Sir, it was stated, I think in one of the reports, that there was three times as much material as was required for the filling on the Bombay Back Bay reclamation, and about one-third is mud, which would make very good filling.

Q.—That would not trouble your dredger?

A.—Then I believe it goes on to say that there is some other kind of clay which is easy to get and discharge through the pipe.

Chairman.—The witness is referring, I think, to Mr. Kidd's report and to Sir George Buchanan's report. He is mixing them up.

Sir Frederick Hopkinson.—You said just now that you had not seen Sir George Buchanan's report?

A.—No, I have not seen Sir George Buchanan's report.

Q.—I do not know where you get that definition of the clay from. I have not seen it. You said you got it from some report?

A.—I believe it is in one of the reports. I am not sure that you may not find it in Mr. Kidd's report. Probably it is there.

Q.—He calls it stiff and unctuous clay?

A.—I believe he does use that phrase, but I have not seen it myself. I have never seen his report.

Q.—To come to another point, the bulk of the material dredged up to the present time in the harbour for Back Bay reclamation has been mud. Is there any reason why the "Sir George Lloyd" should not do 2,000 yards of that an hour?

A.—She could not fail to do 2,000 yards of that an hour.

Q.—But I say she has failed. The figures given to us show that she has failed utterly.

A. You are relying entirely on the reports which you have got from somebody else.

Q.—Certainly the official reports of the measurements taken from the cross-sections; exactly the same as you rely upon the Sewri. You say she did 2,700 yards an hour measured from the soundings. These are the engineer's figures. Do you dispute them?

A.—Well, I dispute this—I saw the clay myself

Q.—No, no, do you dispute the engineer's figures?

A.—How can I dispute them. I do not know anything about the thing.

Q. I do not see how you can dispute them either.

A.—I never took any measurements to check them.

Q.—I am giving you the result of the figures, and I am asking you now how it was that the " Sir George Lloyd " could not do 2,000 yards of mud an hour, because there is no question of clay there.

A.—There is no possibility of her not doing 2,000 yards an hour of mud.

Q.—What is the good of saying that when we have records, extending over three seasons, which show that she has not done 50 per cent. of it?

A.—She might have done nothing.

Q.—And still worked?

A. And still worked, yes.

Q.—What do you mean by that? Do you mean to suggest that they had not been trying to dredge the material at all?

A.—Yes, Sir. I believe they had been trying to dredge the material.

Q. Why do you say she might have done nothing?

A. Quite so; that is a possibility. I understand you to put the possibility that she cannot do the mud.

Q.—There is no possibility at all. I ask you if she could do it, and you say there is no possibility of her not doing it?

A.—That is right.

Q.—Then I ask you why she did not do it?

A.—I do not know why she did not do it.

Q. You cannot complain that the mud is too hard, as you apparently do in the case of the clay. The mud is not too hard, is it?

A.—Mud is not too hard and soft clay is not too hard.

Q.—You know all about the clay in Bombay better than anybody else?

A. Yes, and I know we can get hard clay.

Q.—And you designed the dredger?

A.—Yes, we built the dredger.

Q.—I want you to bear in mind that the description " soft clay " does not appear anywhere in any of the documents we have seen until it appears in your offer to build the dredger?

A. I quite believe that.

Q.—Therefore may I take it that possibly it was left to you to describe the clay, knowing, as you did, so much about the Bombay harbour?

A.—We stated definitely the only kind of material in which we would undertake to do that output.

Q.—Surely not. You designed this dredger for a particular purpose—which was to dredge the clay in Bombay harbour. What is the good of sending a dredger out there if it is designed to do something else?

A.—Sir, I may tell you that we offered to build a dredger in the first instance to do that quantity of soft clay, and that was the standard of output for the dredger. If she had to do harder stuff she would have done less

Q.—You decided on the definition of the clay. It is your definition of the clay which appears in your offer?

A.—Because it is to form the standard of output.

Q.—It was left to you, was it not, to design a dredger to dig the clay which you knew existed there?

A.—I do not know about anything of the kind. I do know we were asked to do what is suggested in this letter.

Q. No, no. They only say " clay " in the letter, and you gave the definition of " soft clay "?

A.—We did.

Q.—Would not you make that definition after using your knowledge and experience of Bombay?

A.—Certainly. I have said so already several times.

Q.—You define the material——

A.—On which we were going to give this output—soft clay. That is right.

Sir Frederick Hopkinson.—Then I do not think I need carry it any further, need I?

Chairman.—He does not quite accept the position as you put it, Sir Frederick.

Sir Frederick Hopkinson.—Yes, he does.

Witness.—What is the real point, Sir? Will you kindly inform me, because I am doing my utmost to get the thing clear.

Chairman.—Putting it in another way I think Sir Frederick's question is this. In as much as you knew what was the character of the material, there was a duty on you when writing the letter of 12th September, accurately and truly to describe it, and that you did describe it as soft clay?

A.—Yes.

Q.—And that Sir George Buchanan and Sir John Biles, and other persons, knowing the extent of your experience in Bombay, might well take the expression " soft clay " to be the true description of the material in Bombay harbour. That is your point, is it not, Sir Frederick?

Sir Frederick Hopkinson.—That is my point.

Witness.—Would you think that point remained when you are told, as I have told you, that we explained that we would make this as a standard for the output, and that when she was dealing with harder stuff she would do so much less?

Chairman.—Where do you ever say that in any letters at all—that when she is dealing with harder material than soft clay she will do proportionately less. Where do you ever say that?

A.—We have not said it in writing. That was discussed at Renfrew. There were six or seven people there when we were discussing this thing.

Sir Frederick Hopkinson.—Even then, assuming you had got plenty of power in the cutter engine, why should the dredger do less in hard clay than in soft clay?

A.—Because hard clay is more difficult to dredge.

Q.—It all depends on the cutter. If it is solid clay, such as that at Bombay, or the stuff you call clay near Renfrew, I say there is a great difference between the two, and that your pumps will discharge everything which your cutters will cut, and that if your cutters have sufficient power they will cut hard clay as readily as a weaker engine would cut soft clay. Is that not so?

A.—If our cutters have sufficient power they will do that, and we will have to get the moorings and everything else that will be strong enough to resist that cutting power in the same proportion.

Q.—It is a downward cut, is it not?

A.—No, it is a side cut.

Q.—There is no difficulty in getting your moorings strong enough, is there?

A.—I suppose there are limits. If we had been asked in the first instance to build a dredger to do 2,000 yards an hour of hard clay, we should have had to put forward a very much bigger and unworkable dredger on account of its size——

Sir Frederick Hopkinson.—Why?

Chairman.—Let him continue.

A. ——or we should have had to put forward two dredgers of the same size as this one. We did not want to undertake 2,000 yards an hour of hard material in one dredger, because we saw that everything was going to get so very big and unwieldy—the moorings and everything else—that we thought it was a much more reasonable thing to have the vessel this size; and it was indicated to us that there was sufficient soft material to make the reclamation without touching the harder, and that it would cost so much less money. If that were so, and if you could make this reclamation with the softer material, and if it would cost you only half the price of the harder, why have the more expensive one?

Sir Frederick Hopkinson.—Who gave you that information?

A.—This was all discussed at Renfrew.

Q.—Who gave you the information about the harder material? You are speaking about discussing whether you would have a dredger that would cut hard material. Who gave you the information abouf hard material?

A.—We are assuming there will be hard material down below.

Chairman.—I do not follow all this. You say that at some interview you were told that there was enough soft material to complete the reclamation?

A.—Yes.

Q.—Who told you that?

A.—Sir George Buchanan.

Q.—Have you got it in writing anywhere?

A.—No. I understand it is in one of these reports, or something.

Q.—No. I will read you the passage in a moment. Mr. Kidd says there was three times the quantity of material required.

A.—That is what I mean.

Q.—But he describes part of the material at all events as being stiff clay?

A.—I do not doubt that for a single moment.

Sir Frederick Hopkinson.—There are two materials—mud and stiff clay—referred to in Mr. Kidd's report, and no others.

A.—I think I would have described some others which are there.

Q.—Your knowledge of the clay and mud in Bombay was so intimate that no description was really necessary to you. You had been there for years and had made several dredgers to deal with it?

A.—We know, generally speaking, the clay that is there.

Q.—I go further than that and say that you had a most intimate knowledge of the material likely to be met with?

A.—Put it that way if you like.

Q.—What margin do you allow, in designing a dredger, between the tests made in a selected place, with selected material, selected coal, selected staff and selected superintendence, and the ordinary working conditions? What margin do you allow over ordinary working conditions? That is to say, supposing you got 2,000 cubic yards an hour under the conditions I have first described, how much would you expect to get under ordinary working conditions when the pumps had worn a bit?

A.—I do not know, because we have never worked under all those selected conditions.

Q.—I suggest to you that you never make a test under any other conditions?

A.—Sir, I am sorry to say you are wrong in that.

Q.—Why did you take this clay at Renfrew as being anything like the clay which the dredger would have to do in Bombay?

A.—Because I think it can be said to be the nearest approach, on the whole, to soft clay which one can get about our place.

Q.—But is it solid clay?

A.—It has to be cut.

Q.—Has it not been dredged over and over again?

A.—Oh, no.

Q.—Are not all dredgers tried near there?

A.—I think most dredgers are tried round about there—all the dredgers that are built on the Clyde. They are not all tried in one hole.

Q.—But in the immediate vicinity?

A.—There is a big area to go over.

Q.—But all the dredgers built on the Clyde are tried in that vicinity, are they not?

A.—Yes. Generally speaking, they are.

Q.—I have a letter from the Admiralty here which says, "According to information available, the surface material at the point indicated by the bearings"—those are the bearings given in the report of the trials—"is mud, and it appears probable that this is of considerable thickness." That is the view of the Admiralty?

A.—Mud on the surface? I think that is right.

Q.—A considerable depth of mud. Your tests were made in that mud, were they not?

A.—They went down. I do not know what depth they did go down to.

Q.—Largely in that mud?

A.—I do not think it was largely in that mud. We took away the surface mud and we went down further than the mud.

Q.—But your measurement was taken over the whole quantity dredged?

A.—Yes, that may be so.

Q.—Therefore it would include this mud?

A.—It would include this mud.

Q.—I put it to you that the test was farcical?

A.—No. I do not think any person can say that at all.

Q.—In the original report of the tests made by the Naval Architect he described it as black clayey silt—not clay at all?

A.—You get many people who say they see the stuff on the surface, they say it is simply silt, but it is cohesive.

Q.—You would not call black clayey silt material you would have to cut, would you?

A.—No, I do not think you would in the first instance, but that is only on the surface, as far as I understand it.

Q.—For several feet down—or, rather, I will not say that, but " is of considerable thickness." That is what the Admiralty say. I do not think you have yet answered the question which I put just now as to what margin you would allow between working under test conditions and working under ordinary working conditions when the pumps had worn.

A.—No, I did not answer that question. You put a lot of selected conditions, and I told you we never do work under those conditions.

Q.—What margin do you allow?

A.—We allow a fair margin, as a rule. I think probably in most cases it is round about 40 or 50 per cent.

Q.—Another thing that occurs to me at the moment is that your tests on the Clyde gave a percentage of volume of solid matter in the pipe of 39 to 41.

A.—Yes.

Q.—Does not that go to show that the test was a farce?

A.—No.

Q.—What do you usually expect to get with a suction dredger—what percentage of solid matter?

A.—We get very varying percentages of solid matter. In clay we have had them up to about 30 per cent.

Q.—What do you normally get? What would you be satisfied with?

A.—I think, as a rule, most people take the round figure of 10 per cent.

Q.—That is what Sir John Biles reckoned. Do not you think it is an extraordinary state of affairs when a dredger does four times her specified output on trials, and yet, when she comes to work, only does half her specified output. Is not there something wrong somewhere?

A.—I do not know which dredger did four times the specified output on trial.

Q.—Well, 40 per cent. You have just spoken of the dredger doing 40 per cent. on the Clyde, whereas 10 is the normal; and 10 per cent. would give you your 2,000 yards an hour.

A.—I beg your pardon; I am sorry. I thought you meant the maximum percentage you might work with.

Q.—You said 30. You said you had had 30, and then you said that normally you would be satisfied with 10 per cent.?

A.—I said that, in the ordinary way, most people took the round figure of 10 per cent.

Q.—That is what Sir John Biles said. I say that that 10 per cent. would give you 2,000 yards an hour?

A.—Yes.

Q.—Is it not so?

A.—I will accept that.

Q.—Therefore 40 per cent. would give you 8,000 yards an hour?

A.—Yes, if we had 40 per cent. going at the same rate.

Q.—You say you had?

A.—No, I do not say we had.

Q.—You say it went up to 39 and 41 per cent.?

A.—I said we can pump——

Sir Frederick Hopkinson.—No, no, it is not what you said; it is what the report said of the trials.

Chairman.—You had better read him the passage.

Sir Frederick Hopkinson.—" Samples of the dredgings delivered through the stern pipe were taken, and those tested varied between 39 and 41 per cent. of solid matter. The material dredged was a black clayey silt." That is 8,000 yards an hour?

A.—I do not think that says they were dealing with that percentage the whole time of the trial.

Q.—At some part of the time?
A.—Yes. At some part of the time.

Q.—If it could do it at some part of the time under those conditions of discharging through the back of the ship, it could do it the whole time?
A.—Sometimes in ordinary working they would be getting nothing at some moment.

Q.—At some moment, but generally speaking?
A.—Well, the test is made in a moment.

Q.—I presume that when you build a dredging plant of this kind you are anxious that it should be a success?
A.—Always.

Q.—Can you tell me whether the failure of this dredging plant has been reported to you from time to time during the last three years?
A.—It has been reported. I do not remember when it was first reported.

Q.—Can you tell me why your anxiety about your " children " did not extend so far as to do something to help to get the proper output?
A.—We were wishful to do something.

Q.—Wishful? Is that all? Did it end there? Did you do anything?
A.—No, we have done nothing so far.

Q.—And all the time the dredgers which you built and guaranteed (because you did guarantee them)——
A.—I think we have discussed that point already.

Chairman.—The " Kalu " and " Jinga."

Sir Frederick Hopkinson : And the " Sir George Lloyd " was guaranteed. They have been lying under the stigma of only doing less than half their specified output?
A.—I think I have already explained to you that we cannot be responsible. We have no authority to go and do anything there at all.

Q.—You said you were asked. You did not want authority; that is your authority. You were asked, you said?
A.—I do not think I said anything of the kind.

Q.—I understood you to say you had been asked several times. It had been reported to you several times?
A.—Yes.

Q.—Very well; is not that asking you?
A.—No, it is a different thing altogether.

Q.—Did not they ask you to make any suggestions for improving the output?
A.—All we got, I think, came through Meik and Buchanan. I am speaking from memory. They occasionally told us (I forgot when they first told us) that the results were not satisfactory. For a long time they themselves could not give us any figures as to the output, for some reason or other, and we asked for them. They said they had asked for them and they had not got them.

Q.—As you know, as a practical dredging man, there is no reason why you should not have your figures the same night, is there?
A.—No, I do not know that there is—none whatever.

Q.—I am asking you now what you did to remedy the poor outputs of your dredgers? Did you make any suggestions?
A.—How could we? We did not know exactly what was the matter.

Q.—You knew they had failed to deliver the output. Did you make any suggestions by which they might deliver the specified output?
A.—We never knew—and I do not know now—that they had ever failed to do the output in soft clay.

Q.—In mud then?
A.—Nor in mud.

Q.—You say you do not know they have failed, although you have been told?
A.—We have been told that they have, but we do not know it.

Q.—I do not think I can carry that any further : I think it is waste of time. I want you to bear particularly in mind that your specification of the work to be done by the dredger does not specify Clyde clay. It is a soft clay.
A.—Soft clay; that is right.

Q.—You said, in answer to a question, that it was not usual for you to examine the material that you were going to design your dredgers to work upon?
A.—No, Sir, I cannot say that it is usual to do that.

Q.—If anybody came to you to have a dredger designed, and he said " I do not know what the material is " would you take that as sufficient?
A.—No. We would tell him that he had better find out.

Q.—What would you do in that case, supposing he said it was clay?
A.—We would tell him that that was not a sufficiently clear description of it.

Q.—You would want to know whether it was soft or hard?
A.—Yes.

Q.—Therefore, to get at the facts, you would want to have samples, because " soft " and " hard " are both relative terms, are they not?
A.—Yes, but at any rate, soft can never be hard.

Q.—Hard clay may be " hard " and " ver[illegible] "
A.—That is so.

Q.—For instance, you would call London clay in the dry very hard, would you not?
A.—We have got nothing to do with the hard stuff. We have only the soft.

Q.—You know Mr. Spiers, the dredging superintendent, I believe?
A.—Yes.

Q.—You have known him for many years?
A.—Yes.

Q.—In fact, I believe you originally selected him?
A.—I believe that is true.

Q.—You know he is a good dredging master?
A.—I have said so to-day already. I think he is.

Q.—Therefore, we know from Sir George Buchanan, in a statement he has made, that nothing human has been left undone in Bombay to make this dredger a success. Have you heard that phrase?
A.—I have not heard that statement.

Q.—At any rate, they have a dredging master with whom you are perfectly satisfied?
A.—Yes, I think he is a very good dredging master.

(*Adjourned for a short time.*)

Sir Frederick Hopkinson.—I presume that when Sir George Buchanan wrote to you that letter of the 25th July, 1919, in which he said : " I shall be satisfied with a test in this country and your guarantee that the plant would do the work required," he was aware that you had an extensive experience of the material to be dredged in Bombay?
A.—I believe he understood so.

Q.—He says : " You have given me a price, and you guarantee, knowing the material as well as you do, that the plant you build will do the work required."
A.—That is so—you tell me what you will do. That is what he says.

Q.—No; he says : " You guarantee, knowing the material as well as you do, that the plant you are offering will do the work required."
A.—We did not give him any guarantee except that which he has got there in our tender.

Q.—I am trying to put before you what was in Sir George Buchanan's mind at the time he wrote this letter. You are going to quote him for a dredging plant. You know the material to be dredged. He says : " I shall be satisfied with the test plus your guarantee that the plant you design will do the work required," That is what he puts in the letter.
A.—That is quite clear.

Q.—Presumably you would have that before you before you quoted?
A.—Absolutely. We read that very carefully before we quoted and before he came there.

Q.—Therefore in your quotation there is an implied guarantee on the basis of this letter?
A.—I do not agree at all.

Q.—You do not?
A.—No.

Q.—That is the condition.
A.—That is what he asked for.

Q.—That is the condition on which he asked you to quote. In your quotation afterwards there was nothing saying you were not going to comply with that condition.

A.—The specification and the offer state clearly what we proposed and put forward.

Q.—To put it brutally, might not it be said that your offer to dredge soft clay, knowing, as you have said, that there were some hard bands of clay in it, might be taken now as a way of evading your responsibility to build a dredger to do the work required in Bombay?

A.—If that was all to say about it, it might be taken so; but it was not so. We stated to Sir George Buchanan our objection to dealing with anything but soft clay in the output.

Q.—That was verbal?

A.—Yes; it was all discussed with him at Renfrew.

Q.—There is nothing in any correspondence to show that you limited yourself to dealing with only a portion of the clay?

A.—I believe that is quite true.

Q.—You said previously that the quality of the clay was indefinite—there were different accounts—and therefore the capacity of the dredger would vary. Is there anything in any letter you have ever written which puts that point forward?

A.—I do not know that there is. It was explained very clearly.

Q.—We shall get on much quicker if you would try to give us yes or no. I do not think you have given us once a plain yes or no to any question.

A.—Sometimes the question is so put that it is almost impossible to give a plain yes or no.

Chairman.—Just take this question Sir Frederick has asked you: Is there any letter that mentions the fact that whilst the dredger would do 2,000 cubic yards per hour of soft clay her output would be reduced when she got into a clay of a hard description?

A.—I do not believe there is.

Sir Frederick Hopkinson.—Then the answer is a simple no. So far as we have got up to the present the word "soft" was put into the contract by Simons, I believe?

A.—By William Simons & Co. They explained the reason.

Q.—Who really designed the dredger?

A.—Well, Sir John Biles designed that dredger. We put forward, in the first instance, the plans and specifications to Sir George Buchanan. He got those. I do not know, but I think that he probably would pass them on to Sir John Biles as based on what he was wanting.

Q.—Is *not* it the fact that the "Sir George Lloyd" and the "Kalu" are almost identical vessels, the "Sir George Lloyd" being 25 feet longer than the "Kalu"?

A.—They are the same type of vessel.

Q.—Almost identical vessels, I suggest?

A.—There are some differences in the arrangement and the machinery, and one or two other things like that.

Q.—But the frames are all the same?

A.—I do not think the frames are all the same.

Q.—We can have the plans and look at them?

A.—You can have the sections and see them.

Q.—The difference in engines is simply a matter of that you make the cylinder of the "Sir George Lloyd" and the "Colaba" 2 inches bigger than the "Kalu," the stroke remaining the same.

A.—If that is so according to the figures and specification, it would be correct.

Q.—The "Sir George Lloyd" was built for 3,000 horse power and the "Kalu" for 2,700?

A.—I believe that is what they developed—something like that.

Q.—There is a difference of approximately 10 per cent. between them which would be accounted for by the slightly increased cylinder diameter in the "Sir George Lloyd"?

A.—I think it is a little more than 10 per cent.

Q.—I say it is approximately 10 per cent. 10 per cent. off would be 2,700, and 10 per cent. would be 300 from 3,000.

A.—I think we put on another 20 or 25 for 3,300 horse power.

Q.—No; it is 27 and 30. The "Sir George Lloyd" is 3,000, and the "Kalu" is 2,700. That is a difference of approximately 10 per cent.

A.—All the horse powers are indicated. Your 2,700 and 3,300 are indicated, and it comes back really to the basis of 25 and 30.

Q.—Who designed the engines?
A.—We prepared the plans and submitted them for approval.

Q.—You actually designed the engines?
A.—I suppose you would say so. We designed these things under the supervision of the Naval Architect.

Q.—You would send him the complete designs of both the dredgers?
A.—Yes, but his men would probably be about the designing department, making comments while the thing is under preparation. He has a staff in Glasgow that are always going about looking after the work.

Q.—Did he send draughtsmen down to Renfrew?
A.—He would not send draughtsmen, but he would send very competent men.

Q.—You say their men would be about while you are designing them?
A.—Yes, they are always in and out to see what is going on. It saves time when we are preparing plans if they come in and indicate whether we are on the way to something that they will approve of. If they waited until the last moment and we sent the plans and we had to go and re-design the whole thing, it would be an awful waste of time.

Q.—I suggest to you there is practically no difference between the " Sir George Lloyd " and the " Kalu," except one is a little bit bigger than the other?
A.—One is a little bit bigger than the other.

Q.—It is a standard design for that class of thing?
A.—We have no standard. That is the wrong word to use.

Q.—Not for this class of ship?
A.—No.

Q.—It is a standard so far as the " Kalu " and the " Jinga " are concerned?
A.—The two vessels are alike. They are built on the same lines and patterns.

Q.—Who designed the cutter?
A.—We put forward the design for the cutter in the same way as the other detailed plans. We put forward detailed plans. They come and see them in preparation and then they are sent to them for final approval.

Q.—Is not the cutter a patented design?
A.—Not at all.

Q.—Is not Mr. Robinson's name on the actual cutter?
A.—Robinson's—it is not.

Q.—Are you sure?
A.—Yes.

Q.—Are you quite positive about that?
A.—Absolutely certain.

Q.—We are told that it is?
A.—Well, I think I ought to ask you who told you such a thing.

Q.- -The engineers in Bombay?
A.—Told you that Robinson's name is on that cutter?

Q.—Yes.
A.—Well, I do not know how it got there because William Simons & Company never put it on.

Q.—Did you supply a spare cutter?
A.—We sent out one spare cutter with the ship. I do not know whether they have got a spare cutter from anybody else since or not—I do not know that.

Q.—There was one sent out to replace the broken one, was not there?
A.—I think so.

Q.—Was not that the same as the one you put on the ship?
A.—That is the same as the one we put on the ship. There is no name of anybody on it.

Chairman.— We will cable to India about that. They say positively you can see the name on it.

Sir Frederick Hopkinson.—There is a direct conflict there. Is not the " Sir George Lloyd " the most powerful dredger you have ever built in the shape of a suction dredger?
A.—So far as pumping power is concerned I think that is so, in one pump. That 3,300 or whatever it is that is spoken of as the power is the power of the pump alone. A great many foreign firms add to that, when they are speaking about power, all the other things, like the cutter engines, the winches and everything, and they make it a massed thing.

Q.—It is the power of the pump?
A.—That is right.

Q.—It is the ordinary power you would speak of in speaking of a pumping dredger?
A.—Yes, but some people in speaking of a dredger add the whole lot.

Q.—Was this dredger and the "Colaba" designed altogether between 25th July and 9th or 10th September when you put your proposals forward to Sir George Buchanan?
A.—We prepared a general arrangement plan in the first instance and a specification, and so soon as we got the order to go ahead with the work we started to work out the detailed plans. Sometimes we anticipate this and take the risk and prepare the designs before we actually get the order.

Q.—You would have to have some sort of designs before you before you quoted for such a big dredger as this?
A.—We had the design of the "Jinga" and the "Kalu" to guide us.

Q.—Their construction, as I said before, was almost identical with the "Sir George Lloyd"?
A.—The general arrangement and appearance of the thing.

Q.—Otherwise you could not have given a reasonably close price unless you had something to go upon?
A.—No, we had the experience of the "Jinga" and the "Kalu" to estimate on.

Q.—Can you tell me what was the specified test in the contract for the "Kalu" and the "Jinga"?
A.—2,000 cubic yards.

Q.—Was the specified test of the "Kalu" and the "Jinga" 2,000 cubic yards per hour?
A.—Yes.

Q.—For how long?
A.—That is what I would call a guarantee—for a certain number of hours.

Q.—That is what I want?
A.—We gave a certain number of hours—78 it was.

Q.—78 hours or days?
A.—78 hours. We worked 10 hours a day, and six of them must be dredging, so that we were bound down to at least 12,000 yards per day.

Q.—That would be mud, would it not?
A.—Soft clay, as specified.

Q.—But the clay in Bombay Harbour is always covered with a deposit of mud 12 to 15 feet thick?
A.—No, it varies a little. Up at Sewri you may only get 3 or 4 feet of mud and then you come on stiffer stuff. At other places it will go deeper. It varies considerably.

Q.—Were your tests made in the first days of the "Kalu's" working?
A.—No.

Q.—Do you know when they were made?
A.—Yes, we have the dates.

Q.—Do you know them?
A.—I do not know them now. I could not give you that off-hand.

Q.—You were out there?
A.—Yes.

Q.—How much dredging had it done before you proceeded with the official tests?
A.—It was only about a week or so—something like that. It was not very long.

Q.—After the dredger had been running for a week you made your official tests?
A.—It might have been a couple of weeks. I cannot say.

Q.—I am suggesting to you that those tests would be made very largely on mud?
A.—Nothing of the kind. We took everything we had down to the hard.

Q.—You may have taken everything you had, but everything you had may have been mud?
A.—But it was not so.

Q.—It was not?
A.—No. I can give you photographs showing lumps of clay which were discharged out of the pipe-line.

Q.—During that test?
A.—Yes.

Q.—That would not affect my remark, which I said was mainly on mud. You might be dredging for 99 per cent. of your time on mud and still be able to show me photographs of lumps of clay?
A.—But there was a very considerable amount of clay there.

Q.—Can you tell me the speed of the cutter of the " Sir George Lloyd " dredger —how many revolutions a minute?

A.—No, I think it is 116.

Q.—Not the engine but the cutter?

A.—I think it is 116.

Q.—Is not it 12?

A.—Yes, the cutter engine you are speaking of.

Q.—The cutter itself?

A.—I think it is about 12 or something like that.

Q.—We were told in Bombay there was a superfluity of power in the cutter engines. She is not working up to 50 per cent. of her possible power. Do you think it would be safe to run that cutter at an increased speed?

A.—You can run her up to the full power.

Q.—That is not what I asked you. We know you can run the engine up to the full power, but I was saying they are not using half the power of the cutter?

A.—Why not use the other half?

Q.—Because I presume the cutter is designed to cut at 12 revolutions a minute and they do not want to exceed that. I am asking you now, would it be safe to run the cutter at an increased number of revolutions?

A.—They can run that cutter as fast as the engine can drive it.

Q.—That can be done?

A.—Yes.

Q.—Perfectly safely?

A.—Yes.

Sir Frederick Hopkinson.—Will you bear that in mind, Mr. Elgee.

Mr. Elgee.—Yes.

Sir Frederick Hopkinson.—Would not it be possible if you ran the cutter faster to get a bigger output of mud and material?

A.—Under certain conditions it would. The only difficulty you might have there would be the moorings, because, of course, when you are running the cutter faster you put on a greater resistance.

Q.—You run your winch faster?

A.—Yes.

Q.—There is no greater resistance but you run your winch faster?

A.—There is greater resistance surely on the wire.

Q.—You run your winch faster?

A.—There is a bigger pull on that wire and you may bring the anchor home.

Q.—Not if it is properly anchored and properly secured?

A.—That is so. The point about that is that with all dredging work it is a troublesome business to keep the anchors in the ground.

Q.—It all depends on the holding character of the ground?

A.—A great deal, I agree, depends on that.

Q.—Altogether? I want to press the point once more about your definition of the clay. In your letter of the 12th September, 1919, to Sir George Buchanan,* you say : " Referring to your esteemed communication of the 25th July, we have now had an opportunity of very carefully considering the plant required for this work and have pleasure in putting before you the following particulars of the plant which in our opinion may be expected to meet your requirements." His requirements were to dredge the clay lying in the bottom of the harbour, were they not?

A.—His requirements, as stated to us, when we explained we could not deal with hard clay, was that it was going to——

Q.—His requirements were dealing with the clay in Bombay Harbour?

A.—Sir George Buchanan told us that he was willing to take this mud and soft clay and to leave the other. I do not know anything about it.

Q.—Were not his requirements to dredge the clay and mud in Bombay Harbour?

A.—He was to take——

Chairman.—Answer the question. You are put a perfectly simple question. Were not the requirements of Sir George Buchanan to dredge the mud and clay in Bombay Harbour?

A.—Yes, to dredge the mud and clay.

Sir Frederick Hopkinson.—That is a simple answer. You then were quoting for a vessel according to his requirements which did not say " soft clay "?

* Sir George Buchanan's published report of September, 1919, page 17.

A.—We put it clearly in our letter that what we offered for was for dealing with "soft clay."

Q.—You must answer this question with a plain yes or a plain no. Did you know that his requirements called for a dredger to dredge clay only?

A.—We knew nothing of the kind.

Q.—You had his letter but you say you did not know. He says in his letter "the clay." He does not say "soft clay"?

A.—No, but we told him we could not do with the plain "clay." We did not accept that.

Q.—You did not tell him that in your letter of the 12th September?

A.—I recognise that. I have said so already. We did not tell him that in that letter.

Q.—His requirements I put to you were to dredge the clay as it existed in Bombay?

A.—That may be so. It does not really matter. The point is that we did not tender to do that.

Q.—I do not want to use an offensive word, but it looks to me as if you are trying to make the Committee understand that you were playing a trick on Sir George Buchanan?

A.—No, we were playing no trick whatever. The whole thing is quite clear.

Q.—Is not that the obvious inference?

A.—The whole thing is perfectly clear. We explained to him we could not deal with this word "clay," because it might mean soft clay or stiff clay or hard clay or anything of the sort.

Q.—You knew that better than he did. You knew the quality of the clay better than he did?

A.—He told us we should get enough of soft clay to do the filling.

Q.—He does not say "soft clay." He says "clay"?

A.—I know he does not say "soft clay" in his letter, but he did say it.

Q.—When?

A.—At this meeting, when we discussed it.

Q.—Do you know why he did not put it in his letter?

A.—He just used the ordinary words.

Q.—His requirements were to dredge clay from the harbour. He does not say "My requirements are to dredge soft clay"?

A.—No; he does not say anything of the kind. It is only when we pointed out that we cannot touch the thing if it is to deal with hard clay at this rate—

Q.—Did he alter his requirements then?

A.—We told him we would make this offer to him on this basis, and we did so make it.

Q.—At this interview did you say to Sir George Buchanan: "Our offer will be based upon dredging soft clay only"?

A.—Yes.

Q.—You did?

A.—Yes.

Q.—We cannot have anything more definite than that. The fact of testing a dredger in Bombay was not an unknown thing to you? You had already had an order for building dredgers to be tested in Bombay?

A.—Yes.

Q.—Do you know why you refused to do it in the case of the "Sir George Lloyd"?

A.—Well, I have already given the reasons twice, I think. One of the reasons was because from the experience that we had had already in Bombay we saw that there were some very uncertain elements in connection with this thing on account of the material. We might be put into a position where we could not get sufficient soft clay. We might have to dredge a lot of hard stuff. We might come on stone. We might do anything, and it did not appears to us to be the sort of risk that a dredger-builder should take. It was much more a risk for a contractor or for the Government.

Q.—Were you afraid, knowing the output of the "Kalu" and the "Jinga" at Sewri for their several years' work, that you would not be able to get 2,000 yards from the "Sir George Lloyd" and the "Colaba"?

A.—We should not get it in hard stuff, and with the soft stuff we did not know what was happening there; whether it would be satisfactory or whether there would be anything else there which would prevent our getting that output.

Q.—You had been working on the Sewri reclamation for years. You told us you were out there twice a year?

A.—Yes.

Q.—Therefore you would know everything these dredgers were doing?
A.—That is so.

Q.—In addition to that you had weekly reports from the dredging masters and the chief engineers?
A.—That is so.*

Q.—So that you would be in close touch with all the work done on the Sewri reclamation?
A.—Quite so.

Q.—In fact, you know almost as much as the people out there who were doing the work?
A.—Yes; I believe so, because they were always telling me about what they were doing.

Q.—Can you tell me when you first heard of the poor output of the " Sir George Lloyd " dredger?
A.—I am afraid I cannot tell you exactly, but it was some time after the first season's work, I think.

Q.—Have you ever had a similar case of vibration in any other dredger or booster that you have had on the " Colaba "?
A.—No.

Q.—I understood you to say this morning that you could not give any reason for that.
A.—No; I cannot say definitely that I have got any definite reason to put forward.

Q.—I suppose no one in this country is likely to know more than your firm about the building of these dredgers?
A.—I think we have built more dredgers than any other firm.

Q.—Therefore there is some unexplained and unexplainable cause?
A.—I do not say it is unexplainable. I rather think it will be explainable. I do not see why it should not be explainable.

Q.—Have not you thought any time in the last three years that you owed a duty to the Bombay Government who bought this dredging plant from you, to do everything in your power to make this machinery a success?
A.—Yes; we have felt that all along.

Q.—Tell us what you did in connection with the " Colaba "?
A.—I will tell you what we did in connection with the " Colaba." In the first place, they wrote and told us that they thought it was because there was not a bracing above the main deck. The " Sir George Lloyd " had a cross-bracing between the main deck and the upper deck.

Q.—They told you that?
A.—Yes.

Q.—Did you agree with it?
A.—No; we did not agree. We told them that the vessel was built without that because it was very much stiffer than the other one, and we did not think it was necessary. We said: " At the same time, if you think we are wrong in this matter we are quite willing to send out material to put that bracing in, provided you put it in at your own expense." We sent the material out, and I believe they put it in. I think I am right in saying that they reported afterwards that it was worse when it was in than before it was put in.

Q.—It did not really make any difference?
A.—It did not make any difference.

Q.—What else did you advise them to do, because you must remember all this time you are more or less in the nature of an expert adviser to the Bombay Government, and that you had great moral liabilities in India, having built so much dredging plant for Bombay?
A.—We were always anxious to help them; we are now.

Q.—I have heard you say that. I want you to tell me what you did actually?
A.—That is one thing we did, as far as the " Colaba " is concerned.

Q.—That is something which you say you knew was going to be no good before you did it. What did you do really to help them out of this difficulty?
A.—I think we made the suggestion—it may have been indirectly—that they should try to find out whether the fitting of an automatic valve near the pump would help it.

* Mr. McMurray notes that this answer relates to the " Sir George Lloyd's " first season and not to Sewri. He had no weekly reports from the men on the " Jinga " and " Kalu."

Q.—That was done and sent out, I believe?

A.—Well, no; it was not done and sent out, if I may say so. They had a valve there already in the ship. They opened it a little to see whether the opening of this valve would do any good, and they wrote home and said it did no good at all.

Q.—It took 20 minutes to open?

A.—It took 20 minutes to open.

Q.—You cannot stop a dredger for 20 minutes to open a valve?

A.—No.

Q.—It would be ridiculous; you cannot do it.

A.—It was not put in for that purpose.

Q.—What else did you do?

A.—We suggested then, as I say, some sort of automatic valve that would open.

Q.—We have got past the valve stage. That was useless and impossible to use.

A.—After that, or, it may be, at the same time, they said they thought it was not that at all, but that it was the bottom of the ship that wanted stiffening. I believe, I do not know, that they started to stiffen it. I do not know whether they finished it or not, but they put additional stiffening in the bottom of the ship.

Q.—I know they did that, but my question to you was: What did your firm do to help the Bombay Government in this difficulty?

A.—That is all they have done so far.

Q.—I am asking you what you have done?

A.—That is all we have done so far.

Q.—You have done nothing else?

A.—Nothing else than that.

Q.—Therefore, if we are in an insoluble mystery you, with your anxiety to do anything for the Government, should have done it before now—is not that it?

A.—Well, we are waiting for an opportunity to do something.

Q.—This is three years ago?

A.—I know it is three years ago, but we cannot always get somebody to go out there at once and see what is the matter.

Q.—You think you will be complying with your moral obligation to the Bombay Government if you do something some time in the future? That is all it boils down to?

A.—No. If they could have indicated to us——

Q.—No; that is not my point at all. It is not what they are to do, but it is what you are to do?

A.—You think that we should have gone out at once?

Q.—I am putting to you that you should?

A.—Very good.

Q.—You think you should not, except when it is quite convenient, after a lapse of some years?

A.—No. We will do it at the first opportunity that is rendered.

Q.—You will, or you have done it?

A.—We have not done it.

Q.—It happened some two years ago?

A.—Yes; I believe it is some time ago since the thing began. There has been a great deal of controversy about it.

Q.—When are you going to send out?

A.—If they decide to give this matter any further consideration, and they wish us to take part in it, I have not the slightest doubt we shall do it.

Q.—I cannot get a plain answer from you. The engineer of the Indian Marine who examined the "Colaba" told us in evidence that the vibration was so great that the funnels worked like *that*, three inches each way, so that they came nearer at the top by six inches, and that a very large number of rivets in the framing of the ship near the keel were loose, and that they put certain stiffeners in. Since then they have taken the engines right down. The engine seating was loose on its bed. We do not know what has been found. I am going to try you once more as to what was your moral duty under the circumstances of having supplied this expensive dredging plant to Bombay. I will put it quite plainly also—your duty to your own reputation. In view of both those things, why have you not done something to get this dredger put into working order?

A.—You are speaking now all the time of the "Colaba," and you are speaking as if we were entirely responsible for this vibration.

Q.—I am not saying anything of the kind. I am asking you what you consider your duty to the Bombay Government should be under the circumstances?

A.—If we have no responsibilities we have no duty.

Q.—You have no duties?

A.—If we have no responsibilities.

Q.—It is like this question of clay?

A.—The question of clay is quite clear, in my humble opinion.

Q.—You have no responsibility?

A.—We made clear what we were offering.

Q.—You have no responsibility, moral or material?

A.—We stated definitely what we were offering, and that offer was accepted.

Chairman.—The position is this. Your firm has had some £855,000 for the goods supplied by you?

A.—Yes.

Q.—There is no controversy, as you put it a moment ago, about the output of the "Sir George Lloyd." From 8th December, 1923, until the monsoon period of 1924, the dredger was turning out 1,020 cubic yards per hour. There is no controversy that in the next year she turned out 856 cubic yards an hour. That, in your view, is a serious state of things, is not it?

A.—It all depends on what the material is.

Q.—Never mind the cause for the moment. It is a serious state of things when that happens, is it not?

A.—For which we are not responsible.

Q.—Never mind that, but answer the question. Is not it, in your view, a serious state of things?

A.—That is so, from their point of view.

Q.—A serious state of things?

A.—Yes.

Q.—If that state of things got no better it would mean that the reclamation would take at least twice as long as was estimated for. That follows, does it not?

A.—Quite.

Q.—If it takes twice as long when you have a million pounds of plant lying about and a very expensive sea wall, the whole enterprise is going to be swamped in interest, is it not?

A.—That follows.

Q.—Now the "Colaba" on her trials showed a vibration, and Sir John Biles stated that he could not give the cause. I read you the exact words a few moments ago. Sir John Biles said there was no satisfactory explanation of the vibration?

A.—Vibration out at Bombay, I believe.

Q.—I think you will find this is not Bombay at all. This is the written statement of Sir John Biles: "As far as can be ascertained from the evidence or other source available there seems to be no satisfactory explanation forthcoming of the cause of this vibration. Apparently it is the vibration that has done the damage."

A.—The vibration out at Bombay, yes.

Q.—These matters having been brought to your notice some two years ago, did not it occur to you that the natural thing to be done was for you, or some other member of your firm of high position, to go straight out to Bombay?

A.—I do not see that we were obliged to go out there.

Q.—I am not putting it as a question of legal obligation.

A.—All right.

Q.—I am putting it on a much higher plane than that. Was not there, in the circumstances, a duty upon you, or on somebody highly qualified, to go straight out to Bombay and say: "Let us help you"?

A.—Well, that may be your view.

Q.—Is not it your view?

A.—No; I do not think so. If they had shown that we were responsible for this, then I should have said Yes at once. We cannot be responsible for this.

Sir Frederick Hopkinson.—Then the law would have said Yes?

A.—Of course it would.

Q.—But, as the Chairman said, he was putting it on a much higher plane than that. Perhaps you do not know what that means?

A.—Yes; I do.

Q.—You have not answered the question as if you did. Can you tell me the capacity of the " Sir George Lloyd " to pump water in cubic yards per hour?

A.—No; I cannot tell you that offhand.

Q.—Surely it is a matter you would know?

A.—Well, we have so many pumps that I could not carry them all in my head.

Q.—Could you let us have it to-morrow?

A.—I will endeavour to let you have it to-morrow.

Q.—Its capacity under working conditions to pump water per hour?

A.—Yes.

Q.—I take it you were not personally responsible for the trials on the Clyde?

A.—I was never near them. I believe I was in India at the time.

Q.—Then I need not ask you anything about it. I presume you would expect to get better results when the pumps and apparatus were new than after they had been working for a year?

A.—No; I do not know that I would say that.

Q.—Does not wear quickly affect the output of a centrifugal pump?

A.—If you are dealing with very gritty material it does.

Q.—With any material?

A.—No.

Q.—Than if you are only pumping water?

A.—No.

Q.—You tell me, as an expert, that the wear on the impeller does not make any appreciable difference?

A.—No substantial difference on a year's work.*

Q.—It does not?

A.—No.

Q.—That is a most extraordinary statement. Did you give this price of September, 1919, in competition with other dredger-builders?

A.—Well, we do not know for certain about that, but we had a sort of notion that other people were tendering at the same time.

Q.—You had?

A.—Yes.

Q.—What was the first you knew about the acceptance of your offer?

A.—We got it from the Director General of Stores, I suppose.

Q.—You only suppose that?

A.—Yes. I am pretty certain. We could not get it in any other way so far as I know. Many things happened in between in the way of altering the price. The prices were going up all the time.

Q.—Did the specification say where the trials were to be carried out?

A.—The trials were to be carried out in this country.

Q.—Did the specification say so?

A.—I believe so.

Sir Frederick Hopkinson.—I have my doubts about it.

Chairman.—The letter of September 12th said so, but here is the specification and it does not say so.

Sir Frederick Hopkinson.—I thought it did not say so. Have you a copy of the specification?

A.—I was under the impression it said so.

Chairman.—There is no reference to the Clyde in the specification, but the test is to be to the satisfaction of the Naval Architect?

A.—I think that is right. It is at the foot of page 2.

Q.—Your letter of September 12th says: " If ordered within three months of this date we could have the dredger ready for trial on the Clyde within 12 months "?

A.—Yes, that was the first offer.

Q.—Then in the specification all that is said is that the vessel is to be tested for dredging to the satisfaction of the Naval Architect?

A.—I think that is right.

Sir Frederick Hopkinson.—In your written replies to our questions you said that before you could give a guarantee as to output in Bombay you would require a guarantee as to the class of material to be dredged?

A.—Quite.

*** Mr. McMurray notes that he was referring to an engine pumping water only.**

Q.—Can you tell me what that means?

A.—It means that we should not have any quibbling like we are having now about the nature of the material.

Q.—How could anyone give you a guarantee when you say the clay varies?

A.—How could they expect us to give a guarantee?

Q.—Answer my question. How could anyone give you a guarantee as to the nature of the material when you say it varies?

A.—I do not know that they could.

Q.—They could not?

A.—Just in the same way we could not give a guarantee.

Q.—Therefore what does your answer mean—it does not mean anything?

A.—It means we could not be expected to give a guarantee if they could not give a guarantee of what it was we were to give a guarantee of. That is perfectly clear.

Q.—Unless they guaranteed something which you know it was impossible for them to guarantee, in other words?

A.—They are asking us.

Q.—Can you remember if you gave a guarantee in the case of the " Oswald " and the " Campbell "?

A.—I believe all those vessels were tried and accepted on the Clyde.

Q.—They were designed to cut and pump hard clay?

A.—That may be so in the specification.

Q.—They accepted them with a test on the Clyde?

A.—So far as I recollect that is the position. They are tested on the Clyde. At any rate they went out and did their work very well.

Q.—In the paragraph I read to you from that Institute of Civil Engineer's book this morning it was stated there by your Chairman that your firm devotes particular attention to their designs to meet the conditions of their intended employment?

A.—That is right.

Q.—The intended employment of the " Sir George Lloyd " was to dredge Bombay clay. What particular attention did you devote to the design of the ship to do that work?

A.—We went very carefully into the whole thing and we put forward an offer to dredge this soft clay.

Q.—That is to say you did not pay any attention to the intended employment of the dredger?

A.—Yes, we did.

Q.—But you say the clay is not soft?

A.—Down below, but I say stiff also. We designed a thing so that it can dredge all the clay in the harbour but the rate of output is based on soft clay.

Q.—I am going to put a final question to you and it is this. When your firm constructed the "Sir George Lloyd," they knew and you knew intimately the conditions prevailing at Bombay and required no further information to enable you to design a dredger to meet the requirements?

A.—We knew as well as anybody and we made that dredger to do everything in the harbour short of the rock, and she will do that.

Q.—Short of the rock?

A.—Yes.

Chairman.—But not at the rate of 2,000 cubic yards an hour?

A.—No.

Sir Frederick Hopkinson.—There is no question of any other rate. It is not mentioned in the correspondence from beginning to end. No other rate than 2,000 yards is ever referred to from start to finish?

A.—I know, and that is the only plant we could give them, a plant to do soft clay which would reach that rate.

Chairman.—Let me see if I clearly understand the position you are taking up. You say : " We contracted to give you a dredger which would dredge 2,000 cubic yards per hour of soft clay "?

A.—That is right.

Q.—But we knew perfectly well that the moment you got into anything like stiff clay the dredger would slow up and would not give an output of 2,000 cubic yards an hour." Is that right?

A.—That is so. If that was the maximum output, 2,000 yards, she would do less in stiffer material.

Q.—Did you ever tell Sir George Buchanan the fact that when the dredger was employed on anything except soft clay her output would diminish?

A.—Yes, we explained it quite clearly to him.

Q.—You explained it quite clearly?

A.—That they were 2,000 yards an hour of soft clay.

Q.—When was that?

A.—At this discussion.

Q.—At this interview that you place in August?

A.—That is right.

Q.—If you explained that to him clearly can you understand his basing the whole of his calculations on the fact that the dredger that you were going to supply would turn out 2,000 cubic yards for 15 hours a day for 170 days of the working year?

A.—Yes, in soft stuff.

Q.—He says nothing about " soft stuff." He describes the clay as hard in his own report?

A.—We explained to him that this machine will do soft, and he says he is going to make the reclamation with soft stuff.

Q.—Where?

A.—He said so to us—that he was going to use the soft stuff.

Mr. Billimoria.—He could not have said that.

A.—Why not?

Chairman.—Do you assert that Sir George Buchanan told you that the Reclamation was going to be made with soft stuff?

A.—He was going to take all the mud and all the soft clay and make that Reclamation. There is more than enough according to the figures to fill that Reclamation.

Q.—We know that he was working on Mr. Kidd's report?

A.—Yes.

Q.—This is what Mr. Kidd says : " The clay, which is stiff and unctuous, hardens into perfectly solid ground in a very short time. As far as possible in the course of the execution of the work the clay would be preferred, not only because of its greater suitability for making land, but also because for dredging purposes its stiffer and more tangible character enables a higher percentage of solid material to be transported by the pumps." That is directly opposite to everything you have been telling us, is it not? There he was relying upon the stiff clay for the Reclamation?

A.—That may be so. I do not know what he is relying on.

Q.—At all events have you got anything in writing to indicate that you ever told Sir George Buchanan that this dredger once it got into anything beyond soft clay was going to slow up in its work?

A.—I do not know that we have.

Mr. Billimoria.—I shall follow up the Chairman's questions. Where did you get the indication that the clay was soft?

A.—We understood that one-third of the material was mud. We had three times as much material as was required for filling in from that area that was to be dredged, and that about one-third of that was mud and about 50 per cent. was soft material. The other was harder materials.

Q.—Except in your letter of the 12th September there is nothing on the record, in any letter, document or paper before us, where any indication has been given with regard to this clay being soft?

A.—I believe that is so. I gather that from what the Chairman has said.

Q.—You gave that indication and nobody else?

A.—We gave that indication of soft clay as the capacity.

Q.—I am not asking you about the capacity. I am only asking you with regard to the clay for the moment?

A —Yes.

Q.—You gave that indication that the clay was soft?

A.—Yes.

Q.—And that indication you gave was from your own personal experience and knowledge of the material that was to be found in Bombay Harbour?

A.—There is plenty of soft stuff in Bombay Harbour.

Q.—You based your estimates on the basis of your own personal experience and knowledge?

A.—If he had told me he wanted to take all the stuff down at the bottom of the harbour, to use the whole of that at 2,000 yards an hour, we should have been obliged to give him something else—two dredgers.

Q.—That is not an answer to my question. Perhaps you will kindly confine your attention to the question and be so good as to reply for we shall be saving a lot of time. There are other witnesses to be examined and we do not want to waste our time.

A.—Yes.

Q.—You need take no offence at my remarks, but this is the position. There was nothing except in your letter of 12th September which indicated that this was soft clay, and that indication was based on your own personal experience and knowledge of the material to be found in Bombay Harbour?

A.—We used the words " soft clay " ourselves to indicate the capacity of the dredger we were offering.

Q.—You also told us in the course of this examination that you mentioned this fact to Sir George Buchanan?

A.—Yes, we did.

Q.—Are you absolutely positive about that?

A.—Yes.

Q.—Do you mean to suggest that Sir George Buchanan's memory was so very failing that within a month of this interview between you and him, he should go and write this report without mentioning a word about soft clay. Is that your suggestion?

A.—I do not know anything about it. I never saw his report.

Q.—Would you expect an engineer in a report to which he has put his signature in regard to a scheme of this magnitude to mention the important fact that he was dealing with soft clay, and yet in fact he describes in the report the material to be " hard clay which lies below the mud over the area," and so on?

A.—I do not know anything about that. I know nothing about it.

Q.—How could an expert engineer have given that report if there was a discussion of the kind you have stated?

A.—I have told you exactly what happened.

Q.—Can you produce any document, any record, or any note of the interview?

A.—The only record we can produce is the tender we offered.

Q.—You rely on the tender?

A.—Yes.

Q.—In which you have put the words " soft clay "?

A.—Yes.

Q.—But that tender is in response to the letter of Sir George Buchanan of July?

A.—Yes.

Q.—In which Sir George Buchanan gives no indication whatever of that, but simply talks of " clay "?

A.—That is right.

Q.—Therefore, any indication that has been given is your own indication, is it not?

A.—We indicated clearly, as a result of this interview we had, what we were offering—a dredger to do soft clay. Nothing else but soft clay was the basis of the output.

Q.—Would the dredger have been otherwise if it was stiff and unctuous clay?

A.—The dredger would have been practically no different if it had been stiff and unctuous clay except the output. The output would have been half, or something less than that.

Chairman.—You are not quite following Mr. Billimoria's question. The question is: Would you have constructed a dredger of a different character if you had guaranteed it to work 2,000 cubic yards per hour in stiff clay?

A.—No; we would not have constructed one of a different character. It would have been much the same, but there would have been two of them.

Q.—Again you are not following the question. What Mr. Billimoria wants to find out is this. Supposing you had been told this dredger has to work in stiff clay and also in hard clay, would you, in writing the letter of 12th September and in giving the specification, have put in a totally different specification for a dredger that had to do work of that kind?

A.—This specification would have been, practically speaking, the same. The only difference would have been that this dredger would have been doing, say, 1,000 instead of 2,000. That is all.

Q.—You do not follow the question. Mr. Billimoria was taking the case of a man who says: " I must have a dredger capable of dredging 2,000 cubic yards per hour of stiff and hard clay." Would you or would you not have provided the same specification, or a totally different one, and at a totally different price?

A.—A totally different one at a totally different price—absolutely.

Chairman.—That is your point?

Mr. Billimoria.—Yes. You would have suggested a totally different plant?

A.—Yes; it would have been much bigger and more powerful.

Q.—Do you suggest now that that matter was discussed with Sir George Buchanan at the interview?

A.—We told him that this was all we could put forward to do 2,000 yards an hour, and if that was not sufficient they would have to get two dredgers.

Q.—Did you tell him that?

A.—Yes.

Q.—It could not have been so because when the order was placed it was distinctly understood that plant was to be built such as would be capable of producing 2,000 cubic yards an hour.

A.—Of soft clay.

Q.—I am asking you whether that point was discussed with him—where does the question of the two dredgers come in? It was a question of a plant capable of producing 2,000 cubic yards an hour. That was the whole point that was discussed, and nothing more.

A.—Well, I explained that. I have explained that that was all we could do if he wanted one dredger for this.

Q.—Did you indicate in your letter of the 12th September that this matter was discussed—that if the clay was otherwise there would be two dredgers required? Do not you think any manufacturer would do it?

A.—The thing was all thrashed out, and this dredger would fit the bill. This dredger would do 2,000 yards an hour of soft clay. It would take any hard stuff there was in the harbour, but its capacity was based on the soft clay.

Q.—If this was going to make a material difference with regard to the output to the extent of cent. per cent., do you want me to believe that a manufacturer would not go and record that in the correspondence or in the agreement or document that he is entering into?

A.—It is quite clearly in writing what we were offering—what we put forward as an offer.

Q.—You have given no indication of that.

A.—It is all there in the tender, what we offered.

Q.—You are relying only upon one word, the word " soft " clay. I want to know whether in the letter of the 12th September you have given any indication to say if the material was otherwise there will be double the plant required, and the cost will be so much more.

A.—You know yourself it is not there. You have read it. It is not in that letter.

Q.—If this matter had been discussed it would have been there. That is what I suggest.

A.—Well.

Q.—If I was placing an order with you surely you would bind me by saying that if you want plant of this description my cost will be double?

A.—It was not done. It was discussed there, and the result of the discussion is that tender of ours.

Q.—You see that whatever transpired between you and Sir George Buchanan was not known to the outside world—and was not recorded on a scrap of paper, or a scrap of writing in your office or outside it.

A.—I do not know anything about that. I only know what we did ourselves.

Q.—When you passed your specification did you call for any material or sample?

A.—No; we did not.

Q.—Because you had your own experience of the material, and you relied on it?

A.—We know what soft clay is. That is what we relied upon.

Q.—You knew what material there was in that harbour, and therefore you did not call for any sample. That is how I put it to you as a plain question. Is not that so?

A.—I am sorry I do not quite follow the question you are putting.

Q.—You did not call for any sample from Bombay?

A.—We did not.

Q.—Because you knew what material this dredger was built for?

A.—We knew what material we offered for. That is the whole point.

Q.—How could you offer for anything which does not exist? I might want to say a gold mine should come out of Bombay harbour. Would you say : " Here is something that I offer, but it is not a gold mine "?

A.—There is soft material in Bombay harbour. There is soft clay.

Q.—So that you need not call for a sample because you knew there was soft material there?

A.—There is soft material there.

Q.—It was your own inference, your own belief, and your own knowledge.

A.—There is soft material.

Q.—How long have you known Sir George Buchanan?
A.—I cannot recollect. It is a number of years now since we first met him.

Q.—How many?
A.—I really could not say. The War is a little bit of blank—ten years or something shoved in there. I really do not remember when I first saw the gentleman.

Q.—Would it be 10, 15, or 20 years ago?
A.—I think it would be about 15 years.

Q.—When did he first approach you in respect of placing an order for a dredger in connection with the Bombay development scheme?
A.—I am trying to remember that this morning.

Q.—Well?
A.—I could not quite remember what it was. It was shortly before he sent the letter to us of the 25th July.

Q.—A little before that?
A.—Shortly before that.

Q.—You discussed very freely with him the whole situation?
A.—Yes; there was a sort of broken discussion one way or another, because at that time nobody was quite sure whether the scheme was going on or whether it was not going on.

Q.—How many interviews had you with him?
A.—I really could not tell you how many. We had interviews one way or another, but the first substantial interview took place at Renfrew.

Q.—At that interview was it practically fixed up that you were to get this order for the dredger if the scheme went through?
A.—No; nothing of the kind. We were tendering for the job. We were going to submit a tender later on. He came there to explain clearly to us the type of plant that he wanted.

Q.—Did you submit any tender or tenders?
A.—We did submit a tender.

Q.—When?
A.—I think you have got it. You have quoted from it several times. It is the 12th September, 1919.

Q.—So Sir George Buchanan discussed with you all the details with regard to the specification of the dredger and what was practically required for Bombay harbour before you submitted a tender?
A.—Yes; he came up and explained to us the type of plant he wanted, and showed us how the pipe lines were to go across the land, and discussed the general question of the dredger. He gave us an indication of the size of boat he wanted, the same as he did in his letter. It is on the basis of that. His letter was really the basis of the discussion.

Q.—In that letter he has given an indication that if there is any material variation he would accept your advice. Did you ever offer him any advice?
A.—I do not quite follow what you are meaning.

Q.—" The proposals I have outlined above are subject to modification if your experts can suggest improvement, and I should like to meet you at Renfrew and discuss details personally at a later date when you are ready for me to do it."
A.—That is quite right. He came and discussed this business and asked us to put forward an offer for a dredger which would do 2,000 yards an hour. That is the basis of what he wanted to do. That is the nearest we got to it.

Q.—Did you give him any indication of any improvement on what he suggested. You prepared the specification and you carried out the thing?
A.—We prepared the design and specification and sent it to him with our tender.

Q.—So that there was no improvement necessary on that?
A.—Well, that is just like giving outlined particulars of what he wants. We made out a specification and tracings and sent it on with our tender.

Q.—Does not that letter indicate that he depended on you materially with regard to expert advice in a matter like this?
A.—Well, you cannot throw the responsibility of the scheme on to us, the dredger builders.

Q.—I am throwing no responsibility on you. There may be something at the back of your mind which I want to get at. Perhaps it is the prickings of conscience?
A.—Nothing of the kind.

Q.—No member of the Committee has ever suggested there is any responsibility on you for the scheme.
A.—What is it you are suggesting now?

Q.—I am suggesting when Sir George Buchanan wrote that letter he depended upon your knowledge and experience and solicited your advice?

A.—We gave him our advice.

Q.—Did you, in September, 1919, agree to build the plant at a cost of about £500,000?

A.—Yes, you have got all these figures.

Q.—About £499,000?

A.—Yes.

Q.—So that before he submitted his report the question of placing the order was practically settled between yourselves?

A.—Nothing of the kind. We submitted a tender.

Q.—What was the arrangement between you?

A.—The only arrangement arrived at was that we should submit a tender. We rather guessed that we should be in competition with other people. That was the beginning and end of it so far as that is concerned. We sent in our tender and then a long time elapsed before we heard anything about it.

Q.—Did you sleep over it after you submitted your tender or were you keen on getting the order?

A.—It may help you an enormous amount, I think, when I tell you when the official order came to be placed we had stipulated for a conditional price, and when I saw Sir John Steevens, who was Acting Director-General of Stores, about the placing of this order he was rather keen on getting a fixed price. We did not know where prices were going to and we did not want to have anything to do with a fixed price. We wanted a conditional price. If the rates of wages and materials went up they would pay us more, and if they went down we would pay them back something, whatever the difference in the rate. He pressed this point, so far as I recollect, and I told him that we really did not care whether we got the order or not if it was going to be a question of fixed price, because we felt we could not take the risk of that fixed price.

Q.—Were prices varying very materially?

A.—Yes, nobody knew where they were going to.

Q.—To what extent?

A.—I could not tell you off-hand to what extent, but everybody knows they were varying very considerably, and we did not accept the fixed price.

Q.—I would like to know what the percentage was?

A.—Percentage of what?

Q.—Of the variation in the prices?

A.—Between certain dates. What dates do you want, and I will endeavour to get it.

Q.—The order was placed on the 15th June, 1920?

A.—What dates do you want the information from?

Q.—Between September, 1919, and June, 1920, I want to know was there any material variation in prices and to what extent?

A.—I will make a note of that and try and get the information if you want it.

Q.—You know that you quoted for this plant less than £500,000 in the beginning, and subsequently when the order was placed it went up to £850,000?

A.—You want the difference between those two?

Sir Frederick Hopkinson.—That is not quite right. £855,000 is the total cost of the dredging plant and covers the " Kalu " and " Jinga."

Chairman.—And the extra pipe-line.

Sir Frederick Hopkinson.—Made in Bombay.

Mr. Billimoria.—Even then there has been a very substantial advance.

Sir Frederick Hopkinson.—I believe it was first £615,000.

Mr. Billimoria.—We will take it at £615,000. Had prices advanced by £100,000 in respect of the plant within this short period?

A.—The prices had advanced so greatly that we could not see our way to take the risk of having a fixed price and we had a conditional price. As it happened, the prices did not go up as we expected them to, and we eventually paid back to the India Office a sum which was round about £30,000, because the rates of wages and materials had gone down.

Q.—I take it that you are a Limited Liability Company?

A.—Yes.

Q.—Or is it a private concern?

A.—We are a Limited Company.

Q.—Private or public?

A.—We are a public Limited Company.

Q.—What is your total paid up capital?

A.—The total paid up capital, I think, at the present moment is £325,000- it may be £375,000, but I forget.

Sir Frederick Hopkinson.—I think it is £375,000.

A.—Yes.

Mr. Billimoria.—You have declared dividends to the tune of 30 per cent., as was read out by Sir Frederick this morning, just about this period?

A.—Yes. We do not get all our money from building dredgers.

Q.—There are other sources of income also?

A.—Yes.

Q.—How long were you busy on building these dredgers?

A.—Well, I think they took about a year to build.

Q.—What profit did you make on them?

A.—On the dredgers?

Q.—Yes?

A.—I could not tell you.

Q.—You could not tell me?

A.—No.

Q.—But you had given an indication to the Director-General of Stores that you were prepared to accept the cost plus 10 per cent.?

A.—I believe that was one of the offers we made for something in connection with this.

Mr. Billimoria.—That is why I am asking you what profit you made on this bargain which enabled you to pay 30 per cent. dividend.

Sir Frederick Hopkinson.—It was 46 per cent. one year.

Mr. Billimoria.—It could not have been 10 per cent. on this order which would enable you to declare a dividend of 46 per cent.?

A.—That is quite evident.

Q.—So that you made much more than 10 per cent.?

A.—No.

Q.—Therefore you have not morally carried out your contract with the Director-General of Stores?

A.—Nothing of the kind.

Q.—Will you please explain if it is nothing of the kind what else is the kind?

A.—The kind is this, that we had a price at which we offered to build this dredger with the condition that if the prices went up so much they would pay us so much more and if they came down we would give them the rate of difference. That is it.

Sir Frederick Hopkinson.—It was not a contract to build the entire dredger at 10 per cent. on the cost?

A.—No, nothing of the kind.

Mr. Billimoria.—In one of the letters that indication has been given.

Chairman.—It was altered.

A.—I have already explained to you that it was a conditional price. We put in a sum there and we had this condition, that if the price rose up we should get more.

Mr. Billimoria.—You made a very handsome profit on this transaction?

A.—I do not know that we did.

Q.—At any rate, you have made more than 10 per cent.?

A.—I tell you already I do not know actually and honestly what profit we did make out of it.

Q.—This order helped your company to make some substantial profit?

A.—I should be sorry to learn that it did not.

Q.—Therefore, you had a moral obligation towards the Government of Bombay who had favoured you with the placing of this order?

A.—We always reckon that we endeavour to look after anybody who does anything for us in the way of placing an order.

Q.—How have you shown that gratitude—by sleeping over it and by not taking any care when you learnt that the plant was not working satisfactorily? That is your gratitude?

A.—I do not think that you are doing rightly here in saying all these things to me.

Q.—I am asking you a plain question.

A.—No. You are putting most insinuating remarks to me.

Mr. Billimoria.—It is not an insinuating remark at all. I am asking you if you made a handsome profit on a transaction is not it your moral duty to help them when they are in difficulties? It is not an insinuation.

Chairman.—What do you say to that? Whether you made a profit or not, you having undertaken the work, when they got into difficulties, Mr. Billimoria wants to know whether you were not under a moral obligation to go to the assistance of the Government of Bombay and try to put things right. That is the question.

A.—We have been always willing to do it.

Chairman.—You had better leave it, I think. The facts are quite clear.

Mr. Billimoria.—Were you very busy at the time these orders were placed with you?

A.—I think nearly everybody was busy.

Q.—If you were so busy, were you absolutely safe in taking this work in hand at that time? You were not so busy that you could have taken on this additional responsibility: May I put it in that way?

A.—I suppose we made room for it. If we had other responsibilities at the time, we made room for this—if we had them. At any rate, we took it on.

Q.—In the course of your evidence this morning you said that the men who were working on the dredgers complained that they wanted more money; that when you went out to Bombay somebody complained to you they were not doing satisfactory work because they were out for more money?

A.—I said nothing of the kind.

Q.—Will you kindly try to recollect?

A.—We were speaking about the "Kalu" and the "Jinga" at the time. Sir Frederick Hopkinson asked why one boat had done so much more than the other.

Sir Frederick Hopkinson.—It was in answer to a question from the Chairman as to why the output was unsatisfactory, and whether it was the fault of the dredgers or not. You said it was not the fault of the dredgers but that the men were not doing the work properly, and they actually complained to you that they wanted more money.

Mr. Billimoria.—I did not interrupt then, but I wanted to know whom you meant by "they"?

A.—Pardon me. I do not think I ever said that in connection with this boat at all. You will see it from the shorthand note. Do you remember my saying it, Sir?

Chairman.—My belief is that you were referring to the "Kalu" or the "Jinga" when you were there some time ago?

A.—That is my impression.

Q.—You were speaking about the "Kalu" and "Jinga." There is no suggestion that you had been on board the "Sir George Lloyd" in Bombay seeing her at work, is there?

A.—I have been on board the "Sir George Lloyd"—the first season she worked.

Mr. Billimoria.—Did anybody complain to you at the time that the output was not satisfactory?

A.—No. There was no complaint to me about the output while I was there. Nobody ever complained to me in Bombay about the output.

Q.—When did you know about it?

A.—Afterwards.

Q.—Through Meik and Buchanan?

A.—Yes.

Q.—How often have you been on the "Sir George Lloyd"?

A.—I do not know; perhaps half-a-dozen times.

Q.—During one visit, or several visits to Bombay?

A.—I think it was two visits to Bombay.

Q.—During both your visits you had no knowledge that she was not doing the work satisfactorily?

A.—No.

Q.—Nobody ever mentioned it to you?

A.—I said at the time that the material we saw there was stiff—some hard bits, and I pointed out that they would not do so much in that stuff as they would do in the lighter stuff.

Q.—You knew very well that you were to give evidence before this Committee some days ago?

A.—Yes, it is a few days ago now since it was arranged that I should come here.

Q.—And you have refreshed your memory by going through all the relevant papers and documents in order to answer any questions that might be asked you in connection with the dredgers that you have built?

A.—I have read through all these *here*.

Q.—And through your own papers as well?

A.— I have endeavoured to find replies to these four questions.

Q.—You have read through all your papers as well to refresh your memory?

A.—I could not read through all my papers; it would take me some time to do it.

Q.—But you know all the material facts concerning the matter?

A.—I think I do.

Q.—So when you definitely and persistently assert that Sir George Buchanan wanted a test in Bombay, on what do you base your persistent assertion?

A.—Sir, I have explained so often here that, as far as I can remember, he did want that. I feel almost certain that he wanted a test in Bombay. That is the position I have taken up.

Q.—When was that—at the very first interview?

A.—I would not say that it was at the first or the second; but, at any rate, it was before he went to Renfrew.

Q.—Did he insist on it that it should be so?

A.—Mr. William Brown tackled him right away, and said: "Of course, we could not agree to any guarantee out in Bombay—to trials out there."

Q.—Would not you expect any ordinary business man coming to your firm and placing an order——

A.—He was not placing an order.

Q.—Anticipating placing an order?

A.—Nor anticipating. He came there in order to ask us to submit a tender.

Q.—You would not take the trouble of preparing a tender and specification without being sure that you were going to get some work, would you? You would not waste all your energies for nothing?

A.—We are doing that every week. We submit hundreds and thousands of tenders, and we never get a penny for it, or any job, or anything.

Q.—When this matter was discussed, as you say, did not he persist that the test should be in Bombay? I want to get at whether he persisted?

A.—I do not know what you call "persist," but we told him we could not do it; we were not going to do it.

Q.—Would not he have given an indication in his letter when he wrote to you that, since it was not possible for a test to be given in Bombay, he would be satisfied with a test on the Clyde? Would not you think that would be the ordinary sequence of events if that had transpired between you and him?

A.—I have already explained to you, as far as I can, that this question about the test or guarantee at Bombay arose before he went to Renfrew—if such a thing arose at all; I think it did. I think my memory is right.

Q.—Did he discuss that with your other partners?

A.—When he went up there I believe what happened was that he was tackled at once by Mr. William Brown, who said he would not agree, under any circumstances, to any test in Bombay.

Q.—Why not?

A.—I have already explained two or three times the reason why we did not consider it was a right thing for us to do—to take on the responsibilities of a guarantee and test in Bombay. At that time we were perfectly willing that somebody else should do the work, as far as that was concerned, rather than we should do it.

Q.—You have told us in the course of your evidence that you did come across Sir George Buchanan in the street, and you met Mr. Halcrow at some time?

A.—Yes, I have.

Q.—Before you came here to give evidence?

A.—Not to-day.

Q.—But before you came to give evidence?

A.—Yes.

Q.—Was the matter ever discussed or talked over between yourself and Sir George, or between yourself and Mr. Halcrow?

A.—Mr. Halcrow and Sir George have frequently discussed in the past this question about the dredger—the reports about the dredger failing to give this output.

Q.—I mean anything about your evidence—as to what you were to say?

A.—Nothing of the kind.

Q.—Did you tell them you were going to give any evidence?

A.—I told them I did not know whether I was going to give evidence or whether I was not. That was the last time I saw them.

Q.—You told them you were either going to give evidence or that you were not?

A.—I told them I did not know whether I was going to give evidence or whether I was not.

Q.—If you were to give evidence, was any suggestion made?

A.—None whatever.

Q.—Did you indicate the nature of the evidence you were to give?

A.—How could I? I could not. I did not know what was going to be asked me here.

Q.—You will not take any affront, or again assume that I am suggesting anything, when I ask you this very plain question. It is an every-day affair. We are living in a world of competition, as you know, and anybody who influences an order, I suppose, expects a remuneration from you, does he not, in the ordinary course of business?

A.—I am very glad you have put that question to me, because I saw the other day—and I was very shocked to see it—in the London "Times," an indication that some suggestion had been made that a commission had been paid to someone who had influenced this order, and that that suggestion had come from Bombay. If you had not given me the opportunity of answering it, I was going to ask the Chairman to give me this opportunity of denying it absolutely, as far as we are concerned. The suggestion in the paper seemed to be that the successful tenderer had paid some commission to somebody for hurrying this thing on and getting the order placed with him.

Q.—Your firm never gave any commission?

A.—No. As far as I know we have never done it, I feel perfectly certain.

Q.—Not in this instance?

A.—Not in this instance, nor in the past, have we ever paid a penny to anybody to influence an order our way.

Q.—I am very glad to hear that.

A.—I absolutely deny it. If you will excuse my saying so, I think you ought to tell me the source of that information.

Chairman.—Mr. Billimoria is not responsible for what appears in the local papers in Bombay. In point of fact, I can tell you what it was. The probability is that it was a speech of Mr. Nariman, who is a member of the Legislative Council, who on 3rd March, 1925, stated that there was a general belief that some commissions had been paid by manufacturers to high officials of the Development Directorate. That is the way in which he put it. That, at all events, is one concrete statement publicly made by Mr. Nariman in the Legislative Council. No particulars or names were given by him.

Mr. Billimoria.—I am glad to hear you have not offered any commission.

A.—Absolutely. We will give you an absolute denial of it.

Sir M. Visvesvaraya.—I have not yet got to the true meaning of your statement about soft clay. Was the dredger designed to dredge soft clay only, or material of average quality found in the harbour?

A.—It was designed to deal with 2,000 cubic yards per hour of soft clay.

Q.—You added a reservation that you attained the average on soft clay, and that when it went on to stiffer clay it would produce a lesser output?

A.—We do not take the average through the different degrees of consistency.

Q.—You only designed it for the rate of 2,000 cubic yards per hour for soft clay on the top?

A.—Soft clay. Anything which is harder than that the dredger will cut, short of rock, of course, but the harder stuff will be at a lesser rate.

Q.—Was the 2,000 cubic yards per hour the average capacity of the dredger in soft clay, or the maximum capacity or the minimum capacity. In soft clay was it the average capacity which you had in view?

A.—My recollection of the matter is that 2,000 yards an hour is the minimum amount you may do, is it not? I think that is what it is.

Q.—Was it the minimum?

A.—I think so.

Q.—In soft clay? Was it the average of the maximum? You said maximum at one time during the course of your evidence. You said the maximum was 2,000 cubic yards?

A.—If it were doing less than that it would not be doing the amount they wanted. It must do the 2,000 yards an hour.

Q.—Sir George Buchanan, in his letter of the 20th July, refers to a minimum capacity of 2,000 cubic yards?

A.—This is minimum here, as far I can read it also.

Chairman.—The " Kalu " and " Jinga " dredged down to a depth of 40 feet, did they not?

A.—Yes.

Q.—That was the extent to which they could go—40 feet below the surface?

A.—Yes.

Sir Frederick Hopkinson.—Below low water level actually.

A.—It does not matter, low or high. It dredged 40 feet below flotation level.

Chairman.—And they cut on some stiffish clay in the harbour, did they not?

A.—Yes.

Q.—The " Sir George Lloyd " was designed to dredge down to 70 feet?

A.—Yes.

Q.—Was not that an indication to you that the " Sir George Lloyd " was wanted to cut right down deep into the clay?

A.—Oh, no. She might go out into deep water.

Q.—Was not it known perfectly well that the area was to be within the harbour?

A.—That is so. She has got to go down to 70 feet; it does not matter where it is.

Supplementary Note put in by Messrs. William Simons & Co., dated 23rd October, 1926.

DEAR SIR,

Replying to your letter of 21st inst., addressed to our Mr. McMurray, the increase in cost of steel between September, 1919, and June, 1920, may be taken at about 46 per cent., and the rise in the cost of construction as between these dates could also be taken at the same percentage.

Yours faithfully,

for WM. SIMONS & CO., LTD.,

A. BROWN,

Managing Director.

(*The Witness withdrew*).

50th Witness, Lt.-Col. S. S. W. Paddon, C.I.E., C.I.M.E., I.A. (retired), Director-General of Stores, Office of the High Commissioner for India.

WRITTEN STATEMENT.

The connection of the India Store Department with the matter under investigation by the Committee would appear to be confined to the action taken for purchase and inspection of the dredger " Sir George Lloyd," the intermediate pumping station " Colaba " and the pipe line.

So far as this Department is concerned the history of the case is as follows :—

In February, 1920, instructions were given by the Secretary of State in Council to the then Acting Director-General of Stores, Sir John Steevens, that preliminary enquiries were to be instituted as to the design and cost of the dredger, etc. The Government of Bombay asked that, subject to the advice of experts in England, the dredger, etc., described on page 17 of Sir G. Buchanan's report on the Bombay Back Bay Reclamation Scheme should be purchased from Messrs. Simons & Co.

For technical advice on work of this kind, the Department employs Sir J. H. Biles & Co., an eminent firm of Naval Architects. The duties of the firm include the preparation of designs and specifications, examination and recommendation of tenders, inspection during construction and approval on completion. In this instance the intimate connection of Sir G. Buchanan with the scheme necessitated some alteration of the normal procedure. The attached copy of a memorandum, dated 16th April, 1920, by Sir G. Buchanan, details his views on the subject, and the suggestions indicated therein were agreed to. The arrangement was that the work should be carried out under the supervision of Sir J. H. Biles & Co., who were to act in consultation with Sir G. Buchanan, and give effect to the latter's engineering requirements.

Messrs. Simons' quotation for the dredger, etc., was submitted on 4th June, 1920, and on the recommendation of Sir J. H. Biles & Co. the dredger and pipe line were ordered on 15th June, 1920. The price, subject to variations in wages and/or cost of materials was £424,345. The intermediate pumping station was ordered on 15th July, 1920, cost £194,970.

On 12th June, 1920, the Government of India telegraphed (copy annexed) that they concurred in the opinion of the Government of Bombay that Messrs. Meik & Buchanan should be solely responsible for the design and construction of the plant. The Secretary of State, however, was not prepared to agree to this proposal, vide attached copy of despatch to Government of India, dated 16th September, 1920, and the arrangement by which the vessels were to be built under the joint supervision of Sir J. H. Biles & Co. and Messrs. Meik & Buchanan remained in force.

On 28th January, 1922, the Naval Architects reported that the trials of the " Sir George Lloyd " had been completed and that the vessel in all respects completely fulfilled the contract. The vessel was therefore accepted.

On 1st March, 1922, the Naval Architects certified that the pumping trials of the "Colaba" had been satisfactorily completed, and subsequent reports, dated 10th and 13th March, 1922, certified that the vessel had been completed and was in order.

I would mention that the purchase and despatch of the vessels took place some time before I assumed charge of the Department, and that elucidation of the details is rendered difficult by the fact that the contract was arranged under the orders of the Secretary of State and in consultation with various departments of the India Office. The Store Department is now under the direct control of the High Commissioner for India, and is completely divorced from the India Office.

MEMORANDUM IN RESPECT TO DREDGER FOR BACK BAY RECLAMATION SCHEME.

At my meeting with Sir John Steevens on the 25th March he informed me that orders had been passed that no contract for the dredger was to be placed until the whole scheme had been sanctioned, but that he, along with his expert, was to go into the question of the dredger with special reference to Messrs. Simons & Co.'s tender. He also stated that Sir John Biles—Consulting Naval Architect to the India Office—would, if the scheme were sanctioned, prepare detailed specification and superintend the construction of the vessel. I replied that I had already discussed this part of the project with the Governor of Bombay, who, I understood, would be averse to any dual control in connection with the scheme because if the dredger failed to do its work we (the Engineers) would naturally say that as we had nothing to do with the dredger we could accept no responsibility. I pointed out that this was not an ordinary dredging proposition, as there was nearly as much work on land as afloat; and that obviously the Engineers to the scheme must have a voice in the construction of the dredger, although Sir John Biles as Naval Architect might reasonably be expected to see that the dredger was a properly built sea-going dredger, and capable of doing the work demanded of her. I said the last thing any of us wanted was friction, and that we were perfectly willing to work jointly and amicably with Sir John Biles, but that we must be given an opportunity of fully discussing and approving all the details.

In a letter from the Director-General of Stores, dated 10th April, Sir John Steevens remarked that the approval of the Secretary of State in Council had been given that all steps short of placing the contract were to be taken in the preparation of the necessary detailed plans and specifications, &c., for the provision of dredger, pumping station, pipe lines, &c., in anticipation of full approval of the execution of the scheme being given at a later date, and the Government of India had requested that the special consideration of experts should be given to the design (or description) and cost of dredger, as put forward in my report, and reference had already been made to Sir John Biles—Naval Architect to the India Office—on the subject.

The dredger, with its pipe line communication with the shore, and the pontoon for intermediate station, would come under the supervision of the Naval Architect; designed generally to meet such requirements as we should wish to see laid down, but the machinery and intermediate pumping plant to be provided on the pontoon would be dealt with by us. Sir John Steevens understood that I had several points in connection with dredger requirements differing from the general description received from Messrs. Simons, and it was desirable that these should be gone into. As a preliminary measure it would be as well for Sir John Biles and myself to meet Sir John Steevens in order that a clear understanding might be arrived at, and any overlapping avoided.

With reference to the preparation of the necessary detailed plans and specifications, the usual custom amongst engineers is to accept the contract on a general specification, thereafter requiring the builders to submit for approval all detailed plans and specifications, and presumably this will be the procedure in the present case. It is therefore clear that the first thing necessary is to place the contract. If, on the other hand, Sir John Biles is himself to prepare complete detailed plans there must be some considerable delay in placing the contract.

With reference to the suggestion that Sir John Biles should be responsible for the whole of the work afloat, and that we should be responsible for the whole of the work ashore, I do not think such an arrangement is practicable, as the whole of the dredger installation must be taken as one complete piece of machinery, and for one engineer to be responsible for the work afloat and another engineer for the work ashore would end in no one being responsible for the proper working of the entire plant.

We welcome the suggestion that there should be a meeting in order that a clear understanding might be arrived at, and any overlapping avoided. We do not wish to interfere with Sir John Biles' prerogative as Naval Architect to the India Office; all we are concerned in is that we as the engineers, and therefore better acquainted than anyone else with the work to be done, and also being entirely responsible for the working of the dredger, should be permitted to express our opinion in respect to the detailed plans and specifications for the whole plant, and that nothing should be done which is seriously

opposed to our views, and further that, although we welcome Sir John Biles' assistance in the inspection of the dredger during construction, we may be permitted to keep in touch and have consultations with him from time to time.

(Signed) GEO. C. BUCHANAN.

16, Victoria Street,
Westminster, S.W.1.
16th April, 1920.

(*Copy of telegram from Viceroy, Public Works Department, to Secretary of State, dated Simla, 12th June, 1920. Received, 14th June, 1920, 3.0 p.m.*)

My telegram dated 19th May. Position of Meik and Buchanan in relation to D.G. of Stores India Office. Government of Bombay consider that engineers of this firm should be responsible for design and construction of dredger. They consider dual responsibility most undesirable and that engineers who will have to work with dredger should be wholly responsible for it. We agree with Government of Bombay.

India Office, London.
16th September, 1920.

Revenue,
No. 108.

To His Excellency the Right Honourable the Governor-General of India in Council.

MY LORD.—In your telegram of the 19th May you informed me that the Government of Bombay had appointed Messrs. Meik & Buchanan as their Consulting Engineers for the Bombay Development Scheme. Their duties were to prepare drawings, estimates, &c., for the whole scheme, and to do all the inspection and supervision work both in India and in England. The payment for them was to be 2 per cent. on the total cost, including (as I understand your telegram) the cost of the dredger and other plant.

Duties and remuneration of Messrs. Meik & Buchanan in relation to the Bombay Development Scheme.

2. Before the receipt of this telegram I had already, in consequence of your telegram of the 23rd December, 1919, consulted my Naval Architect regarding the design and cost of the dredger and dredging plant, and had arranged that their construction should be carried out under the Naval Architect's supervision.

3. Your telegram of the 12th June suggests that it is desirable to give to the engineers of Messrs. Meik & Buchanan full responsibility for the design and construction of the dredger. I have carefully considered this suggestion but for the reasons stated in the enclosed notes[1] by the Director-General of Stores I have decided to adhere to the arrangement under which the construction of the dredger and dredging plant will be done under the supervision of the Naval Architect, who will give full effect to the requirements specified by Messrs. Meik & Buchanan. Messrs. Meik & Buchanan are quite willing to accept this arrangement.

[1]Dated 11th June and 20th June, 1920.

4. It has now to be considered by Your Excellency's Government whether any alteration is required, so far as the work on the dredger and dredging plant is concerned, in the figure of 2 per cent. on the total cost fixed, according to your telegram of the 19th May, as the remuneration of the Consulting Engineers. As the Naval Architect received 1 per cent. on the cost it will probably be thought that 1 per cent. is sufficient for the Consulting Engineers, and I understand that they would be prepared to accept this rate of payment.

[2]From Governor of Bombay, dated 22nd July, 1920.
To Governor of Bombay, dated 24th July, 1920.

5. As regards the method of calculating the percentage to be paid to the Consulting Engineers, reference is invited to the enclosed copy of telegrams[2] exchanged with the Governor of Bombay.

I have the honour to be,
My Lord,
Your Lordship's most obedient humble Servant,
(Signed) EDWIN S. MONTAGU.

ENCLOSURES.

Enclosure No. 1.—Note by the Director-General of Stores.

I note the terms on which Sir G. Buchanan's firm have been appointed.

So far as the dredger pipe line, intermediate station and shore connection are concerned, the construction will be carried out under the supervision of the Naval Architect to this Office.

It has been arranged that Sir J. Biles will act in consultation with Sir G. Buchanan, and give effect to his engineering requirements in connection therewith. The whole of the detail work for this important portion of the supply being undertaken by Sir J. Biles whose remuneration will be at the rate of 1 per cent. of the cost, it would appear that some readjustment of the terms with Sir G. Buchanan, so far as the dredger, &c., is concerned, might properly be made.

The cost of the dredger, &c., will be about £600,000.

I am, &c.

11th June, 1920. J. STEEVENS.

Enclosure No. 2.—Note by the Director-General of Stores.

The Government of India very rightly in their telegram of the 23rd December, 1919, asked us to consult experts to consider design of dredging plant, &c., upon information supplied by Bombay.

The construction of all vessels, dredgers and equipment to meet India's requirements is carried out by the Naval Architect to this Office.

There is no reason for any departure from this course, in fact, I have no hesitation in saying that any departure would only be attended by delays and difficulties of supply.

The designs now prepared will comply with all the requirements of the Consulting Engineers, Messrs. Meik and Buchanan, and the provision is proceeding to give full effect to requirements put forward by them. No ill-effects from this arrangement may be anticipated, but on the other hand the efficiency is likely to be strengthened.

It is seen from the previous telegram of the 19th May that payment of 2 per cent. was to be made to Messrs. Meik and Buchanan in connection with the provision of dredger and plant. It is proposed that this be divided between the Naval Architect and that firm 1 per cent to each. I feel confident that this arrangement will produce the best results.

The construction of all steel products is a matter of much difficulty, and with the number of dredgers now under construction by the Naval Architect, places him in the better position for carrying out work of this description.

I am, &c.,

29th June, 1920. J. STEEVENS.

Enclosure No. 3.—Telegram from Governor of Bombay, dated 22nd July, 1920.

Reclamation of Back Bay. In the calculation of the actual expenditure thereon I am not certain whether in the Consulting Engineer's percentage remuneration should be included in the cost of dredger, or only the net cost after the sale value has eventually been realised. Probably there are many precedents in connection with this technical question. If you would ascertain the usual practice in such cases I should be obliged Having done so, please find out what terms Sir George Buchanan will accept in this respect.

Enclosure No. 4.—Telegram from Secretary of State to Governor of Bombay, Public Works Department, dated 24th August, 1920.

924. Your telegram dated 22nd July, Buchanan accepts net cost, that is original cost less realisation value Explanatory letter follows.

ORAL EVIDENCE.

Chairman.—What is your official position now?

A.—Director-General, India Store Department, in the office of the High Commissioner for India.

Q.—That Store Department, I think, is now under the direct control of the High Commissioner, and is divorced from the India Office?

A.—That is correct.

Q.—I think, in February, 1920, you had no concern with this matter?

A.—No. I was in the Stores Department, but not on the purchase side. I was head of the technical side of the Store Department then, and I was not in the India Office at all. I never saw these papers.

Q.—But you have collected from the papers the information which is contained in your written statement?

A.—That is correct.

Q.—I need not take you through that in detail, because that can appear in the Appendix. You state, however: "In February, 1920, instructions were given by the Secretary of State in Council to Sir John Steevens, that preliminary enquiries were to be

instituted as to the design and cost of the dredger. The Government of Bombay asked that, subject to the advice of experts in England, the dredger described on page 17 of Sir George Buchanan's report should be purchased from Messrs. Simons & Co." When you say the Government of Bombay asked that the dredger should be purchased from Messrs. Simons & Co., is that in some document?

A.—It is in a despatch from Bombay Castle to the Rt. Hon. Edwin Samuel Montagu, H.M. Secretary of State for India.

Q.—What is the date of that?

A.—The date of that is the 9th January, 1920.

Q.—I do not think you have given us a copy of it?

A.—The documents which are the property of the Secretary of State I have not been able to furnish, because I have only copies on my file. I thought you could get the originals from the India Office.

Q.—Would you kindly read that—just the material portion?

A.—" Purchase of a dredger in connection with scheme. We accordingly forward herewith a copy of report submitted by Sir George Buchanan on the Back Bay reclamation scheme. The dredger which we desire to purchase is the 42-inch dredger with electrically driven intermediate station described on page 17 of the report, and in the specification on pages 20 to 24 thereof. It will be seen that on page 19 of the report Messrs W. Simons & Co. have offered two prices—either a price based on the rates current for wages and material, or a fixed price of £451,500, they taking the risk of further increase in price. We prefer the fixed price offer, which it has been ascertained will be kept open beyond the period usually fixed till the 10th March, 1920, at an advance of 10 per cent." It is not really definitely stated there that the order is to be placed with Messrs. Simons & Co. It appears to be an implication that it should be placed with Messrs. Simons & Co.

Q.—Is there anything in that despatch which speaks of " subject to the advice of experts in England "?

A.—Yes. The despatch begins by saying " subject to the advice of experts in England regarding design and cost."

Q.—So that the Government of Bombay in that despatch did anticipate that experts (in the plural) would be consulted with regard to the design and sufficiency of the dredger?

A.—Yes, it appears so. They say " experts in England."

Q.—In point of fact it happened that it was decided for certain reasons that the expert who should be employed should be Sir John Biles, the Naval Architect?

A.—My predecessor thought it necessary to use Sir John Biles & Co., but he also thought it advisable to employ Sir George Buchanan. They were both employed actually. They had the same fee, each of them—I per cent.

Q.—There was no employment of what I might call independent non-official experts in England, was there?

A.—The firm of Sir John Biles & Co., are independent non-official experts.

Q.—Is he non-official?

A.—Yes. He is not a member of our staff.

Q.—But he is normally employed by the India Office?

A.—Yes, as and when required. He is not paid a retaining fee.

Q.—And it was to him and to him alone that this matter was submitted?

A.—No. Sir John Steevens had a consultation with Sir John Biles and Sir George Buchanan together.

Q.—I accept that, but keeping to the point of " subject to the advice of experts," the only expert was Sir John Biles, leaving Sir George Buchanan out for the moment?

A.—Yes.

Q.—Did not the Government of Bombay and the Government of India take the view that Sir George Buchanan alone should be responsible for the sufficiency of the plant?

A.—Yes. They telegraphed that view.

Q.—But the Secretary of State was not prepared to assent to that, and required that Sir John Biles should come in as a check, and that he should share joint responsibility?

A.—That is correct.

Q.—There is a memorandum of the 16th April, 1920, by Sir George Buchanan, which you have given us, which sets out his views at that time?

A.—Yes.

Q.—We know that the quotation of Messrs. Simons was submitted on the 4th June, 1920, and on the 15th June, on the recommendation of Sir John Biles, the dredger and pipe line were ordered. Then there follow the trials which have been spoken of on the

28th January, 1922—the trials of the "Sir George Lloyd," and the 1st March the trials of the "Colaba"?

A.—Do you wish me to verify the dates?

Chairman.—No, I am taking them from your statement. Having regard to the material in your written evidence I think that is all I want to ask you.

Sir M. Visvesvaraya.—The Government of Bombay requested the Director-General of Stores to purchase the dredgers from Messrs. Simons & Co.?

A.—I would slightly correct that. It is not said in the despatch in so many words that we were to buy it from Messrs. Simons & Co. It appears to be the implication, but it is not clearly put. It says: "The dredger which we desire to purchase is the 42-inch dredger with electrically driven intermediate station, described on page 17 of the report." That is Messrs. Simon's dredger.

Q.—It is usual to invite tenders in a Department, is it not?

A.—Yes. It is certainly usual to get more than one tender. I cannot speak with first-hand knowledge, but apparently in this case four tenders were obtained by Sir George Buchanan. Those four tenders were examined before the Secretary of State was ever asked to do anything in the matter, and after examining the four tenders this one was selected as the best.

Q.—Who selected it?

A.—The Government of Bombay.

Q.—You had nothing to do either with the inviting of the tender or with selecting any of them—I mean the Director-General of Stores?

A.—No, but it was open to the Department to invite fresh tenders, I presume.

Q.—That is merely a formality?

A.—No, it would not have been a formality if the Department had decided to reinvite fresh tenders; but, of course, they had to take the instructions of the Secretary of State.

Q.—Did they invite fresh tenders?

A.—No, they did not.

Sir Frederick Hopkinson.—Actually there were only two tenderers. One declined to quote, and the other said they could not quote without a lot more information.

A.—All this business of the tenders must have been done in India before my Department got any instructions.

Sir M. Visvesvaraya.—The tenders, or copies of them, are in possession of your Department, are they not?

A.—No, not those four tenders.

Q.—They were all sent to Bombay?

A.—Yes.

Q.—Were they sent to the engineers, Messrs. Meik and Buchanan?

A.—I have no first-hand information.

Q.—Practically your office was merely a post office in connection with this transaction?

A.—No, not so much a post office. Prices in those days were rising rapidly, and an entirely new price had to be agreed. Also, of course, it was subject to the advice of experts, and those experts might have required, and did require, certain modifications.

Q.—Did you consult any other experts besides those two?

A.—Only those two.

Q.—There must have been some special circumstances for treating this transaction in this way. Were there any, from the correspondence you have seen? Were there any special circumstances which led to this procedure being adopted—I mean not inviting tenders in the usual course, and examining them?

A.—There is nothing in my collection of papers to show any. May I explain it? If I received now instructions of this nature, the first thing I should do would be to take the High Commissioner's orders; that is, I should see the High Commissioner regarding a big project of this sort, and he would then give me his orders verbally. Then I should proceed to take action. I might give the High Commissioner advice which, if he did not accept, I should consider overruled, and that would end that, and I should carry out his wishes. There is no record on the papers of what advice my predecessor gave the Secretary of State, or if he gave any advice at all; but apparently his orders are quite clear; his orders were to purchase the dredger, and to purchase quickly.

Q.—Will you kindly pursue your argument? You said if you had orders now you would proceed in a certain way. What is the procedure nowadays, bearing in mind that this is a very large order?

A.—Under the present *régimé* there is no doubt what we should do. I should go to the High Commissioner and advise him to advertise for fresh tenders. That would be my advice to-day, but the policy of advertising our business has grown up in the last few years

Q.—That is no use to us. I want to know what the practice was in those days.

A.—In those days practically no tenders were advertised. Mr. West will correct me if I am wrong. Comparatively few were advertised. In these days all the big ones are advertised. But in those days the process was to invite tenders from the trade register. That register was a list kept in the Department of firms under each speciality. Any firm in the world could apply to go on to that list, and no applications were refused provided the firms had the facilities and the resources to carry out the business.

Q.—After reviewing tenders, what was the next stage?

A.—Having got the tenders they would be examined technically by the technical advisers (the Department has many technical advisers), the consulting engineers, the consulting naval architects, and so on. If the technical advisers found any fault with the lowest tender, they would have to give convincing reasons why the lowest tender should be passed over from their point of view. If the Director-General was satisfied with those reasons, he would look at the next tender. If there were reasons why that should be passed over, he would go down the list until he arrived at a tender which was, in all respects, satisfactory.

Q.—Do you take any steps to communicate your opinion to the Bombay Government or to the local Government in India?

A.—Do you mean our opinion on this Simons' tender?

Q.—Did not you send those tenders to the local authorities there?

A.—Are you talking about the present time?

Q.—Formerly?

A.—No. We practically never send tenders out to India, or very rarely. We are in the position of purchasing agents to the people in India, who entrust us with their business, within the limits of the funds provided.

Q.—How is it, then, that the engineers themselves were allowed to invite tenders and deal with them direct with you?

A.—I cannot answer that. That seems to have been the arrangement made by the Government of Bombay.

Q.—It is an unusual procedure?

A.—Quite unusual.

Q.—The Government of Bombay recommended that Messrs. Meik and Buchanan should be solely responsible for the design and construction of the plant?

A.—Yes.

Q.—And that the purchase of the dredger should be solely from Messrs. Simons and Co?

A.—I think that is so. I think the despatch implies that, at any rate.

Q.—Then the Secretary of State decided that the dredger should be designed and built under the supervision of both the firms?

A.—Yes; but their respective responsibilities were fairly well defined.

Sir M. Visvesvaraya.—Now that things have gone wrong, who do you think is responsible?

Chairman.—If you are wise, Colonel Paddon, you will turn to us and say that that is for us to decide.

Sir M. Visvesvaraya.—I want the opinion of a gentleman who is dealing with such tenders from time to time.

Chairman.—That is a duty for us, and a matter on which we should not take any evidence.

Sir M. Visvesvaraya.—Do we not require the advice of experts on it?

Chairman.—No. He is not an expert on advising us on whom to place responsibility. He may be an expert on other matters, but not on that.

Sir M. Visvesvaraya.—In the last paragraph of the second page of your memorandum you say: "It is therefore clear that first thing necessary is to place the contract"?

A.—That is not my memorandum.

Q.—I am sorry; it is Sir George Buchanan's. He says in the third paragraph on page 2: "It is therefore clear that the first thing necessary is to place the contract"?

A.—Yes.

Q.—Is it the usual thing to place a contract first and then to draw up the specification and plans?

A.—No, not in that way. The usual procedure with a plant of this nature would be to draft what we should call an outline specification first, which would give the various designers in the trade a broad outline of what was required.

Q.—Would that be the procedure at that period or now?

A.—The procedure is exactly the same. I can talk of 1920 with great confidence on this point. The Department procedure would be exactly the same. Our technical advisers would draft a broad outline specification, tying the trade down in the points which mattered, and leaving latitude for the trade to put in their own details. That would go out to public tender. Then, when the tenders were received and judged, somebody would get the order. After he got the order he would have to satisfy the technical consultants with regard to all the detailed design. He would have to clothe the skeleton.

Q.—Before the contract was signed?

A.—No. The contract would be signed subject to his satisfying our technical advisers on all the details.

Q.—But in this case the suggestion of Sir George Buchanan is that the first thing necessary is to place the contract and then proceed with the preparation of detailed specifications and plans, is it not?

A.—Yes, but as a preliminary to placing the contract you must draw up an outline specification.

Q.—But he says " to place the contract." Was the contract so placed, as recommended by Sir George Buchanan, before the plans were prepared? I want to know whether the contract was placed as recommended by him in that memorandum?

A.—I think so, the details remained to be filled in after the contract was placed.

Q.—Was that not unusual?

A.—I think it was a valid contract—the one which they placed. I have been looking through it very carefully. It is not in the usual form but it was undoubtedly drafted by the Legal Adviser to the India Office.

Q.—He says: " With regard to the preparation of the necessary " (&c., reading to the words " present case ").

A.—That was the procedure.

Q.—Was it safe to do so—to place the contract first and then go in for detailed plans? One can understand working plans, but not detailed plans and specifications?

A.—We have to order all plant and machinery of a large nature in that way. New types of locomotives are ordered in that way. There is no real difficulty.

Q.—Is it subject to the detailed plans being finally approved?

A.—Yes. The contract falls through if your contractor fails to put up detailed plans which you accept. Until these have been approved the contract has not been carried out.

Q.—You are not aware whether that was done in this case or not?

A.—Yes, it was done in this case.

Q.—Do not you usually test machinery and plant ordered on this scale under normal working conditions? This dredger was designed to pump 2,000 cubic yards per hour through a pipe line of a certain length. Do not you usually test machinery and plant ordered under normal working conditions?

A.—Yes. The technical experts test under the nearest they can get to the exact working conditions, but the difficulty is that one cannot always reproduce the exact working conditions at the other end of the world.

Q.—Do dredger manufacturers decline to give guarantees if they are asked to deliver the machinery and plant in working order on site?

A.—I cannot say they always decline, because we have placed an order since this one in which the final inspection was to be on site in India, but we have had an extraordinary amount of difficulty about it owing to the variable factors.

Q.—You probably have to pay a little more in such cases?

A.—Yes, we might have to pay a little more; but apart from that, we have not settled that one yet. There are so many points on which the dredger builder can argue—for instance, that the crew were not handling it right, or the coal was not good enough, or the mud they were digging was not quite to the specification, or the ability of the crew to get the best out of the engine, the length of pipe line, and things like that.

Q.—If one builder is not willing, if there is proper competition others might be willing?

A.—Well, there is very limited competition in the whole of Europe. You could not get more than probably four or five useful tenders for a dredger.

Sir Frederick Hopkinson.—In the whole of Europe?
A.—Yes.

Q.—You mean Great Britain?
A.—No. We have had a good many tenders for dredgers out by advertisements, and we have never got very many useful tenders. We have got some rubbishy ones. The good firms include, I think, two Dutch and one French and about three English.

Q.—The Dutch people lead the world in dredging?
A.—I do not know. We got their tenders. It is not like locomotives where you can get 25 or 30 good tenders.

Sir M. Visvesvaraya.—Your office did not examine the other tenders you received —for instance, that of Messrs. Lobnitz?
A.—I have no first-hand knowledge that there were other tenders, but I have heard so. I have heard that Sir George Buchanan got competitive tenders from four firms.

Mr. Billimoria.—You had no hand in placing the order, and hence you have no personal knowledge of the circumstances under which the order was placed with Messrs. Simons?
A.—No. I am afraid I have no first-hand knowledge. Sir John Steevens is dead, I am sorry to say.

(The Witness withdrew.)

51st Witness, Sir Stanley Reed, K.B.E.

Q.—How long were you associated with Bombay?
A.—For 29 years.

Q.—When did that association begin?
A.—In 1897.

Q.—Were you latterly the Editor of " The Times of India "?
A.—For 16 years.

Q.—When did you become the Editor?
A.—1907.

Q.—From 1907 to 1923 you were Editor of " The Times of India "?
A.—Yes.

Q.—You should know something of the social, economic and financial conditions of Bombay?
A.—I think I do.

Q.—The first date we have been dealing with as regards the conditions of living in Bombay has been 1911. In the report of the Bombay Development Committee, 1924, Mr B. W. Kissan gives some figures, and he says: " According to the census of 1911, out of the total population of 929,082 living in 200,308 tenements, 743,247, that is about 80 per cent. of the total population, live in 166,337 one-roomed tenements." He was there quoting from the census of 1911. Can you tell us whether conditions got better after 1911, or did they get worse?
A.—They got infinitely worse. I speak with a little confidence because I was Chairman of two Committees appointed to inquire into the settlement of industrial disputes. One was a semi-private Committee appointed to advise the Governor and the other was a public Committee which made an official report to the Government. All the evidence, given before both Committees, was conclusive and emphatic on one point—that the pressure of housing, the shortage of housing, and the over-crowding and insanitary conditions of the great mass of the people was the greatest social and economic evil with which we had to deal in Bombay, and that without a much more rapid progress in improving housing conditions than was then being made by the Improvement Trust and other bodies, we could not look for any real social or economic health in the population of Bombay.

Q.—What was the date of that report?
A.—I am speaking from memory; but I think the first was in 1919 and the second was in 1921.

Q.—By 1919 we are told there had been a very great immigration of people in the city owing to the prosperity of Bombay?
A.—There undoubtedly was. Although the figures are rough, it is calculated by those who were in touch with conditions (I am speaking particularly of the Health Officer of the Bombay Municipality) that the number ran into hundreds of thousands.

Q.—The figure which has been given to us has been an increase from 929,000 in 1911 to about 1,500,000 in 1919, 1920 and 1921?

A.—Those were approximately the figures given to me by the then Health Officer—between 1,400,000 and 1,500,000.

Q.—Between 1911 and 1919 had there been any building corresponding in any degree with that increase of population?

A.—None.

Q.—Is that the reason why you told me a few moments ago that the conditions in 1919 and 1920 were infinitely worse than those described in the census of 1911?

A.—Yes.

Q.—At the period, 1918, 1919, 1920, was there great prosperity in Bombay?

A.—Tremendous.

Q.—Was that partly owing to the demand for cotton?

A.—It was partly owing to the demand for cotton, partly owing to the demand for cloth, partly owing to the immense war activities which had been carried on which made Bombay the great embarkation centre for the Indian Forces overseas, and partly due to the world demand for Indian produce at very high rates. In fact, I think it would be true to say that in all the great Bombay staples there was an abnormal demand at an abnormal price with an abnormal profit.

Q.—That, of course, was one of the causes which attracted the immigration to Bombay?

A.—Yes.

Q.—We know that H.E. The Governor announced on the 3rd August, 1920, the creation of a new body, the Development Directorate?

A.—He did.

Q.—One of the objects of the Development Directorate was the reclamation of Back Bay?

A.—It was.

Q.—How did the public receive that announcement?

A.—With surprisingly little manifestation of interest, and such manifestation of interest as there was, was almost entirely favourable. If I may go back for one moment, ever since I have been in Bombay, and long before, this question of the Back Bay reclamation has overshadowed all other questions for the development of the city and its suburbs. It is not on official record, but I believe a private Committee reported to the Military Department of the Government of India in 1898 that a large reclamation at Colaba was imperatively necessary in order to provide for the military requirements of Bombay. Not only that, but in Bombay the position in regard to reclamation has always been very peculiar.

Sir Frederick Hopkinson.—It goes back to 1865, I think.

Chairman.—1863 was the first undertaking.

The Witness.—The one I am speaking of was a private Committee. Bombay exists on reclamations. Take away reclamations and there is no Bombay. There is a mean collection of mean islands, housing a mean city. If it had not been for the beginning of reclamations in the '50's, with the old Elphinstone Company, Bombay would be a mean city to-day, and would not contain any potentialities whatsoever for being the second city of the Empire. Yet at the same time at no period in those 29 years was it possible to mention the word reclamation without bringing down upon you the vials of the wrath of some of those who remembered the collapse of the '60's. They remembered the collapse of the '60's but they did not remember the cause of the collapse, '60's—which was not that the reclamation was a bad thing in itself, or badly carried out, but the bank which held the reclamation money went bankrupt.

Chairman.—The Company had put 90 lakhs of money into the Asiatic Banking Company?

A.—That is what brought it down.

Q.—And the Asiatic Banking Company went into liquidation and away went the 90 lakhs?

A.—But the benefits of the Bombay reclamation of the '60's were incalculable, quite apart from the fact that without it there would have been no Bombay-Baroda Railway into Bombay. The whole of that magnificent foreshore is the free legacy to the people and the Government of the reclamation activities of the '60's.

Q.—They did a certain amount of work?

A.—They did a vast amount of most valuable work, and they laid the foundations, in a very material respect, of modern Bombay. But so little was that remembered that when the Improvement Trust launched their little reclamation at Colaba, the prophets of woe raised loud their voices in the land. You would have thought the Presidency was going to be hurried into bankruptcy. On the contrary the Colaba reclamation brought the Improvement Trust a profit of 15 lakhs.

Q.—We were told that the cost was five lakhs, and that in two days they sold out the land for 24 lakhs?

A.—Then I was within the mark.

Q.—It would be a profit of 19 lakhs?

A.—I think it would also be safe to say that, although there was a period of waiting, every man who built on the Colaba reclamation and retained his property made either cent. per cent. or 200 per cent. on his investment. Then, again, take the Mazagon-Sewri reclamation, of which not so much has been heard. I suppose there was no estimate in connection with that reclamation which was not falsified, and I presume that the cost both of the reclamation and of the development of the reclamation was vastly in excess of the estimates of the Port Trust. Yet the advantage of that reclamation to the trade and commerce and industry of Bombay, now it is developed, has been so tremendous that if a decision had to be taken to-day, with full knowledge of the total cost, I have not the shadow of doubt that there would be an overwhelming demand for it even at that cost.

Q.—I gather from what you say that you would approve of the whole of the reclamation being completed as it was originally proposed?

A.—I would qualify that, if I may, because there is an unknown quantity. After all—you will correct me if I am wrong—it seems to me that certain engineering and constructional works have to be determined in the light of the dominating factor of the rate of sale of the land, and the price at which the land will be sold. That again is dictated by one consideration, and one consideration only, namely, the prosperity of the mill industry.

The price of land in Bombay rises and falls exactly as the profits in the mill industry rise and fall. The textile industry dominates the town to such an extent that the other factors like the cotton trade and the general business, are not sufficient to counteract any marked movement up or down of the mill industry. It is almost true to say that nobody in Bombay who has anything at all is without a share in a mill. Thousands of share transactions are made every year in one, two or three shares at a time. If you get a bunch of share transfers, you will not get 50, but a dozen, of one, a dozen of two and a dozen of three, even of 100 rupee shares. That shows how tremendously wide is the diffusion of the holding in the staple industry of the island. It has been calculated that the difference between profits in a thoroughly lean year in the Bombay mill industry and a good year (I am not taking a boom year) is the difference between 50 lakhs of rupees and 4½ crores (£375,000 and £3,375,000). It stands to reason that when the mills are bringing in profits of 4½ crores, the amount available for the purchase of land is very different from the time when the mills are bringing in 50 lakhs. If there is any revival of the textile trade there will be a great revival in Bombay of the demand for land, but when that revival will be is the unknown quantity.

Mr. Billimoria.—You cannot foresee that.

A.—I am optimist enough to say that when you have a great industry, with the whole of its raw supply at its back, and the whole of its market at its back, if that industry cannot stand in competition with the industry in any other part of the world there must be something radically wrong with the organisation, and the management and the finance of that industry.

Sir Frederick Hopkinson.—Is not the history of industry a series of ups and downs?

A.—It is.

Chairman.—At present you are in the trough?

A.—At present we are in the lowest depths of depression which I have ever known in my 29 years in Bombay. It far transcends the worst days of plague and famine of 1896-97 and 1899-1900.

Sir Frederick Hopkinson.—And in 1919 you were at the greatest height of optimism?

A.—We were absolutely on the crest.

Chairman.—Does not experience suggest that there will come a time when the prosperity of Bombay will be renewed—not perhaps to the height of 1919, but it will be renewed to a normal extent as a city with an immense and increasing volume of trade?

A.—Yes. Unless the whole of our historical readings are inaccurate, we have every right confidently so to expect.

Sir M. Visvesvaraya.—It is the swing of the pendulum?

A.—Yes.

Sir Frederick Hopkinson.—Is it not the same with this country to-day?

A.—Of course it is. In Bombay the present position is abnormal in this way—that, quite apart from the depression in the staple textile trade, Bombay has invested for it enormous sums in other enterprises which are not now bringing in any return whatsoever. I think I could show that this investment is somewhere in the neighbourhood of 20 crores of rupees. All these things have combined to produce in Bombay a depression which is wholly abnormal. I do not want to be extravagant, but it seems to me quite unreasonable.

Q.—And not likely to continue?

A —And not likely to continue.

Mr. Billimoria.—You know the history, perhaps, better than anybody else, because you have edited "*The Times of India.*" Are you of the opinion that the capitalists are opposed to this extension scheme in Bombay?

A.—If I were a large owner of land I should not desire to see other land coming into the market. That is only human nature.

Q.—But have these capitalists much influence in moulding public opinion?

A.—That is rather a wide question to answer. Some of them undoubtedly exercise a considerable influence, not because they are capitalists, but because of their character and their public services.

Q.—I am not opposed to capitalists. I am only asking whether the capitalists in Bombay exercise an excessive influence on public affairs there?

A.—To say that the capitalists in Bombay exercise an excessive influence on public affairs is a proposition which I should not care to accept.

Q.—They are the backbone of Bombay?

A.—They are the backbone of Bombay, and they wield an influence which rightly belongs to their courage and enterprise.

Q.—A good deal of the prosperity of Bombay is due to their courage and enterprise?

A.—Not only the prosperity, but the public and social services. We have a very public-spirited body of wealthy men.

Mr. Billimoria.—What is their attitude towards the reclamation scheme?

Chairman.—Let us have what it was first, and then what it is now?

A.—I should feel inclined to say, in the first place, that, when the scheme was launched, their one attitude was one of tolerant acquiescence. As a matter of fact, you know that so convinced were the business men of Bombay that, not only was the reclamation desirable, but profitable, that two separate syndicates each offered to put up 5 crores (£3,750,000) of rupees to carry out the work on their own responsibility.

Sir Frederick Hopkinson.—The statement was made that this Back Bay reclamation was going to produce enormous profits amounting to as much as 32 crores. Would not that be inclined to make them have a very active acquiescence in the scheme?

A.—There are two ways of looking at it. The 50 crores would go to the Presidency. The lowering of the price of land, if I were a landowner, would come on me.

Sir M. Visvesvaraya.—The value of land would go down?

A.—I would put it the other way : the abnormal and oppressive accretion in the price of land would stop. We know that the price of land in Bombay reached intolerable proportions. I see that in some of the statements put before this Committee land was referred to as selling at the price of 1,000 rupees a yard. Land at 1,000 rupees a yard is almost cheap. Land was sold down in the cloth market years ago at more than 1,000 rupees a yard. I think a site in Hornby Road was bought at 1,400, 1,500 and 1,600 rupees a yard, and a small corner to round off a site was sold at 2,000 rupees a yard. As a matter of fact, about 1919, to attempt to carry on business in Bombay was a nightmare. You never knew when you would be turned out of your accommodation or premises if you did not own them, and, not only that, but you never knew whether you could get any other accommodation. It was not only a question of price ; it was a question of getting anything. The pressure which there was on every class of property was almost inconceivable. Flats were at twice the price at which they were in the city of London

Sir Frederick Hopkinson.—We were told that the prices of flats were quite as high in Bombay as they were in the West End of London.

A.—I should say they were almost as high as they were in New York.

Q.—We were told that a small flat would cost about £750 a year?

A.—That is a moderate sized flat. I can tell you of my own experience. Quite moderate flats let at £100 a month.

Q.—Unfurnished?

A.—Yes, but that includes rates and taxes.

Sir M. Visvesvaraya.—Land to the west of Hornby Road sells at about 1,000 rupees per square yard?

A.—About that.

Q.—If you created a large area of reclaimed land, prices would come down very considerably, would they not?

A.—If they did not come down they would not go up any more.

Q.—Property would depreciate to some extent?

A.—Or it would be static. I would not like to say it would depreciate, because if there was prosperity in the Island there would be ample demand for land.

Q.—Do you happen to know why the Government decided in 1919 to carry out the work departmentally?

A.—I do not know. I do not know whether it has been put before this Committee, but I know why the Port Trust decided to carry out their reclamation departmentally. It was this—that reclamation by dredging being a very doubtful proposition, they invited contracts. All the contractors put on a 30 to 45 per cent. margin, and Sir Walter Hughes, the Chairman of the Port Trust, said : " If we have to pay a 45 per cent. margin, we had better carry it out ourselves." That is why the Port Trust did it departmentally, although they had two tenders from very good firms. I imagine the same considerations probably influenced the Bombay Government, but I know nothing personally.

Sir Frederick Hopkinson.—Did the Port Trust do it cheaper than the tenders which were sent in?

A.—I could not give you the actual figures, but I doubt if they gained much of the margin which the contractors put on.

Sir M. Visvesvaraya.—The first estimate was about 367 lakhs (£2,752,500)?

A.—Yes.

Q.—The second estimate was 702 lakhs (£5,265,000).

A.—Yes.

Q.—Now it is likely to cost 1,000 lakhs (£7,500,000).

A.—Yes.

Q.—If, when the original estimate was prepared, they had considered what it would have cost to have done the work by dry filling, they would have found that it could have been done for about 500 lakhs. If they had known that the work could have been done in the ordinary way for 500 lakhs, would they have sanctioned the estimate for 702 lakhs?

A.—I would rather not express any opinion on those matters, because I am not really qualified to do so. I have never gone into the technical side of the scheme. I have confined myself to the social and economic side of the development work.

Q.—It is stated that the 702 lakh project was not submitted to the Government of India. You are aware of that, I suppose? There was a 367 lakh project, which was submitted to the Government of India and to the Secretary of State, and which was sanctioned by those authorities. The 702 lakh project, however, was not submitted to the higher authorities, and it was not submitted to the Legislative Council, but it was sanctioned. Some official witnesses have told us that the question came up at Budget time, and that the Budget, being passed, it was tantamount to an approval of the estimate. Do you think that was a correct procedure, from your knowledge of the Reform scheme?

A.—Without a much closer examination of the details, I would rather express no opinion.

Chairman.—That is neither an economic nor a social matter?

A.—No, and those are the only things on which anything I might have to say might possibly be of any value.

Sir M. Visvesvaraya.—Is it not usual to publish a statement of financial results when any scheme of this magnitude is prepared?

A.—My own experience is that, when estimates are exceeded, it is very hard to get the truth, whatever body is concerned.

Q.—Do you mean to imply that the truth was concealed?

A.—No, I am simply speaking to a general practice.

Q.—The Kay Committee have stated that the completion of this scheme is not a commercial proposition, and that it should be carried out gradually. What is your view of the proposal?

A.—My own view, for what it is worth, is that in this matter we have to throw our heart over the fence. We have to take a very much more robust view of the future of Bombay than has been taken by a good many people in the depressing circumstances of the last two years. There does not seem to me to be any question that Block 8 must be finished, and, if necessary, an application made to the Government of India to pay or to recoup the Bombay Government for any loss thereon; also that Blocks 1 and 2 should be finished without any delay. By the time that is done we shall know a great deal better than we know to-day what are the prospects of a revival of a demand for land in Bombay, and then a further decision may be taken. With that doubt, I would not go beyond that stage to-day, but to fall short of that stage it seems to me would be very unfortunate.

Q.—Do you consider that the work should be under the P.W.D., or should be left under the Development Directorate?

A.—I am strongly of opinion that, under the present circumstances, it would be greatly to the advantage of all concerned if this work were put under a special P.W.D.

organisation. It may be quite unfair to the Directorate (I am not criticising them), but we have to deal with facts, and the fact is that the Directorate has lost public confidence. The first thing to do is to revive public confidence, and I think that if the work were put under a superintending engineer of the P.W.D., with a couple of assistants, and worked on P.W.D. lines, it would go an immense way towards restoring public confidence and securing the scheme's efficient and economic completion to whatever stage may be decided upon on this Committee's advice.

Q.—Would you associate a Committee with it?

A.—I would leave it to the P.W.D. There are no questions of policy to be considered now, and I think if you got a good man in charge, it would be very much better if you let the P.W.D. have a free hand in pushing the constructional work to completion unhampered. When it comes to the utilisation of the land, then unofficial opinion will be of the greatest value.

Q.—Having regard to all these difficulties, do not you think it wise to associate a Committee with the Department?

A.—I have quite an open mind on the matter, but my own confidence would be given ungrudgingly to a P.W.D. organisation.

Sir Frederick Hopkinson.—I like your expression—and I hope it will be remembered—that it is desirable to take a robust view at present. I should like my colleagues to bear that in mind.

Sir M. Visvesvaraya.—But his robustness does not go very far.

Sir Frederick Hopkinson.—It goes far enough for me. I want a robust view. Do you think anyone connected with the P.W.D. at present is cognisant with the work of large dredgers of this kind?

A.—No.

Q.—Therefore I am going to suggest to you that perhaps a better method might be found than putting it under the P.W.D. I would also suggest to you that the P.W.D. officials are not accustomed to have what you describe as a free hand, are they?

A.—No.

Q.—They have not been trained to have a free hand?

A.—That is true.

Q.—Therefore they would be in a very great difficulty, in all probability, if they had to exercise a free hand in connection with large questions. A man has to be trained to take responsibility, has he not? If a man has not been trained to take responsibility, he is generally incompetent to do so. Do you agree?

A.—I agree.

Q.—Therefore I am suggesting that possibly you might get a better organisation than a P.W.D. one?

A.—I am not in the least dogmatic on it.

Q.—You would favour any organisation which would produce the result?

A.—Partly that, but also an organisation which is calculated to establish public confidence. The two things are wanted, I think, and not only the one.

Q.—You want to establish confidence first?

A.—I do.

Q.—Do not you think the surest way to get real confidence would be to tackle the job in the right way?

A.—Undoubtedly.

Q.—And to produce quickly some definite results?

A.—It would.

Q.—You know the configuration of the reclamation? It is, roughly speaking, a parallel strip of land along one side of Bombay for a length of three or four miles?

A.—I have walked over the whole of it.

Q.—Just shut your eyes, and in imagination see that completed and built upon, with recreation grounds, roads, marine drive, delightful sea breezes coming over the parapet. Is not Bombay as a city going to be enormously improved by that?

A.—Beyond words.

Q.—Or beyond any money you could put to it—within reason, of course?

A.—Within reason.

Q.—And is not that a very strong reason for completing the scheme, if it is by any means within the bounds of practicability?

A.—I am certain as night follows day that the scheme will be completed, and I am certain that if I live 10 or 15 years longer, I shall see it completed.

Q.—Not unless they improve on the dredging?

A.—That is a technical point, on which I express no opinion. I am referring to the attitude of the public towards the Scheme. We are a mercurial people, always either on the crest of the wave, when everything is for the best, or in the trough, when ruin stares us in the face. At present we are in the trough, and we are, speaking for the City as a whole, in a state of depression which I venture to describe as unreasonable. But as soon as the staple industry revives and results begin to come in, I feel confident that the Scheme as a whole will be demanded in the interests of the community as a whole.

Q.—Indians or British?

A.—All. I speak of Bombay as a single entity, for there we are all one. Our temperament being what it is, confidence will revive with better trade and definite results. At present the Reclamation is in the most depressing stage. Everything is going out and nothing is coming in; our amenities are being disturbed, and there is no compensating benefit. All great developments work pass through this stage. With an improvement in trade, and with visible proof of the benefits the reclaimed land will confer on the city, I feel confident that there will ultimately arise a demand that the whole Scheme shall be completed.

Mr. Billimoria.—You have mentioned about the acquiescence of the people in the matter when the scheme was first launched. You will remember that with the exception of the Indian Merchants' Chamber, who sounded a note of warning, the rest of the public decidedly acquiesced in the scheme?

A.—That is so.

Q.—But the Indian Merchants' Chamber opposed it from the very start?

A.—They did.

Q. Then you have mentioned about the Improvement Trust's scheme of reclamation at Colaba. That was a very small strip of land. It was a very small area compared with the present reclamation under consideration of 1,145 acres?

A.—Yes.

Q.—It has always been suggested in the past, as we find from Government records, that if a smaller reclamation had been possible it would have been a much more welcome and more productive proposition?

A.—That, of course, as we know from the records, was the subject of a long discussion between the Government of Bombay and the Government of India from 1911 onwards.

Q.—The scheme was launched during a period of boom?

A.—It was.

Q.—The biggest boom which Bombay had ever had in its history probably?

A.—Certainly since the '60's.

Q.—You do not expect, do you, in the near future a repetition of such a boom? We would certainly welcome it most warmly if ever it came off, but you do not expect it, do you?

A.—No, I do not.

Q.—And the prosperity of Bombay, as you very rightly remarked, depends entirely on its textile industry?

A.—It does.

Q.—That is going through a very serious state of depression at present, and there is a committee now sitting to give it some sort of relief if possible?

A.—On the other hand, I heard to-day of one mill which was making a profit of 35,000 rupees a month, which is rather a healthy sign.

Q.—There are always exceptions to the rule, but those exceptions are always few?

A.—I think we have faced the worst.

Q.—The mill industry is not in its previous prosperous condition, nor is it likely to be for some years to come, because of the Japanese competition. Is not that so?

A.—I would like to qualify that a little. When I was in Bombay last January I was discussing this very question with some friends of both of ours, whose competence you will admit with me, and they said "If Japanese exchange goes to 128 Japan is down and out." The Japanese exchange to-day is 133. As a matter of fact, Japanese competition is due to wholly abnormal conditions in the movement of exchange to and fro between the buying and selling points. If Bombay cannot beat Japan to a frazzle, with the cotton at her doors and with a market at her doors, then she is not the Bombay I know.

Sir Frederick Hopkinson.—It means there is something wrong?

A.—It would make me ashamed of the city.

Mr. Billimoria.—Bombay has to find out fresh markets. The Chinese market has been captured by Japan now. It has to go into new fields of venture, and it may take

some time before we see the normal prosperity return to the mill industry in Bombay. That is the view generally held by sound financial people in Bombay?

A.—It will be slow, I think.

Q.—Having regard to that state of depression you would certainly not recommend rushing on with a scheme of this magnitude, because there would not be money flying about, which would bring forward purchasers for land?

A.—I would certainly not rush it—no.

Q.—In your editorials in " The Times of India " at one time you suggested that the congestion could be relieved to a very great extent as far as commercial offices were concerned if they shifted to Apollo Bunder or near the Victoria Terminus. But people are conservative; they confine themselves to that small area near the banks and business houses, and the tendency has still been to cling to that, although some offices have shifted very nearly towards the Apollo Bunder?

A.—We are much less conservative than people think we are. When I went to Bombay they were building the Chartered Bank near the Gymkhana, and everybody said to me " Do they think that anybody is going into the middle of the jungle to do banking business." The whole hub of Bombay was in Elphinstone circle. When we built our own " Times of India " office we went to Bori Bunder station, and men used to say to me " I am not going to take a week off to come and see you." The business quarter has changed again and again and now it is moving towards Ballard Pier. We think we are a conservative people, but we can more quickly adapt ourselves to changed conditions than we give ourselves credit for.

Q.—But those changed conditions come very slowly in Bombay. The people confine their activities within a very small compass do they not?

A.—Look at the changes which you and I have seen in 30 years.

Q.—I am putting the question in reference to your answer in which you quoted the figure of 1,400 rupees and 1,600 rupees being realised for a square yard of land in an important part of Bombay. If you go further up you do not expect to get that price?

A.—No.

Q.—And especially within the reclaimed area you surely can never imagine or hope, for generations to come, to get such a fabulous price?

A.—Nothing like it. On the other hand, there is one question connected with the reclamation which perhaps has not been put before this Committee, and that is the great difference between suburban life in India and in England. In England it is no hardship on me to walk a mile from my house to the station and come to London and then walk half-a-mile to my office. But in India, if I walk five minutes to the station I arrive at the office in such a state that I want a bath and a change. And when I say that I am taking no account of the hot weather and of the monsoon. For that reason it seems to me that land within easy access of the business quarter will always command, for residential purposes, a much higher price than it would command if it were in any other part of the world where those conditions do not obtain. In Bombay it pays you to pay a much larger rent to live within easy driving distance of your office than it would proportionately, in any other country or temperate climate.

Q.—I entirely agree. Compared to the value that one could expect to realise for land in the suburbs, the value in the reclaimed area is bound to be higher, because it is in close proximity to business houses, but is not cost a material factor for the production of the land?

A.—Undoubtedly.

Q.—If the cost itself is going to be exorbitant then it is not a financially sound proposition?

A.—No, that is so.

Chairman.—In December, 1917, were there two syndicates ready to put up very large sums of money for the purpose of having the concession to undertake this Back Bay reclamation scheme?

A.—There were. I was a member of one of the syndicates as representing the Tata Bank. There were two syndicates, composed of the ablest business men in Bombay.

Q.—The one syndicate consisted of the following gentlemen: Sir Sassoon David, Sir Shapurji Broacha, Sir Fazalbhoy Currimbhoy, Sir Vithaldar Thakersey, Mr. (now Sir) Lallubhai Samaldar.

A.—They are amongst the shrewdest business men in Bombay.

Q.—Then there were Tata & Sons, Ltd., who can also fairly be described as shrewd, can they not?

A.—They were then the dominating influence in Bombay.

Q.—Those two syndicates were working at first in opposition to each other, each being of desirous of getting a concession for the reclamation; but did they subsequently join together?

A.—The two syndicates did combine and eventually an answer was given through Sir George Carmichael.

Q.—The answer was given on the 8th April, 1918. Sir George Carmichael wrote a note summarising the position, and the Government of Bombay decided to obtain expert advice before taking any action?

A.—That was so.

Q.—What was the combined capital that these gentlemen were prepared to venture on the Back Bay reclamation scheme?

A.—It was estimated that each syndicate could put up five crores of rupees.

Q.—At 1*s.* 6*d.*, that is £3,750,000?

A.—Yes.

Sir Frederick Hopkinson.—That would more than have completed it under Sir George Buchanan's estimate.

Chairman.—And that £3,750,000 would have been provided by the members of the syndicate?

A.—They were perfectly confident they could raise the money with ease.

Q.—That showed that some business men in Bombay did believe in the ultimate financial success of the scheme?

A.—I think you might put it a little stronger than that and say that all the leading business men in Bombay at that moment were convinced of the financial soundness of the scheme.

Sir Frederick Hopkinson.—I was a little puzzled about your suggestion that the work should be put into the hands of the P.W.D. Do you know any single man in the P.W.D. who has had any experience of reclamation on an open sea front?

A.—No.

Q.—Or any practical work in connection with a rotary suction dredger?

A.—No.

Q.—The P.W.D., as a rule, do their work on land and not on water?

A.—Yes.

Q.—Do not you think it would be a highly risky and dangerous thing suddenly to transfer this work into the hands of men who had had no previous experience of marine dredging operations at all?

A.—It seems to me that it never has been from the very beginning in the hands of anybody who has had any experience of dredging operations on a great scale.

Q.—At all events the scheme has now connected with it engineers and people who have been associated with it for two or three years and who are now running it?

A.—I should like to stress the psychological factor. The psychological factor goes a tremendous way with our people. No matter how competent it may be, an agency which does not inspire confidence will not serve its purpose. What I have at the back of my mind is an agency which will inspire confidence so far as any human agency can. I simply quote the P.W.D. because that is the agency we know best. I have not any dogmatic view, but I do venture to suggest, with all deference and all respect for those who are in charge, that after what has gone on for the last three years, the factor of confidence should be put very high.

Sir Frederick Hopkinson.—I quite agree, and I suggest to you that the only way in which that can be done, in a lasting manner, is to have a thoroughly competent person there directing operations.

A.—I suggest, with all deference, that there are two essentials to be secured, and they are indissolubly associated. They are to set up an agency which will at once command public confidence and secure the efficient and econmical prosecution of whatever work is to be done. I have suggested the P.W.D., because that is an agency which commands public confidence and has carried through most of the great constructional works in India. The alternative is a first-class firm of engineers, whose reputation stands so high as to ensure efficiency and economy.

Q.—Always remember this—that engineers (and I speak of them as a class) are not contractors, and this work can only properly be handled by a contractor.

A.—I quite agree.

Sir M. Visvesvaraya.—What is meant by Public Works supervision in your mind is that you want a very efficient man at the top, and for all special work like running an engine or dredger, you want men who are experienced in that class of work, working under the P.W.D.?

A.—Yes. I think many people misunderstand our P.W.D. system. They think they do everything themselves; they do not; they work through an extensive system of contractors.

Q.—In this case you want one very competent man who has had experience of reclamation work; and for all special work, like working a dredger, or taking soundings, you want specialists in those particular lines?

A.—That is my view.

Sir Frederick Hopkinson.—Is it not the universal experience all over the world that really good and great things are always done by an individual?

A.—It is.

Sir M. Visvesvaraya.—There is a danger of leaving things to one man.

Sir Frederick Hopkinson.—Not if you get the right man.

Sir M. Visvesvaraya.—It is very difficult to know of him beforehand.

A.—I take my hat off to the P.W.D. every time. It is a very eminent service which is, speaking broadly, absolutely above suspicion. It is accustomed to handling Indian conditions and if you could find an outstanding contractor, would still like to see a senior P.W.D. man in charge of the work.

Sir Frederick Hopkinson.—Although he has no experience of that kind of work?

A.—Although he has no experience of that kind of work.

Q.—And is not accustomed, as you said just now, to stand alone?

A.—Give him his technical advisers.

Q.—Then you will destroy the edifice. It is the man at the top who should be the adviser. You cannot give a man a technical adviser. The man at the top should know it himself. He should be his own technical adviser.

A.—If you could find the man.

Q.—I can find the man.

A.—Then I bow; but subject to finding the man I have my affection for the P.W.D., but I am not in the least dogmatic on the point.

Mr. Billimoria.—With reference to the sentence that was referred to just now as to the Tata Syndicate and the other syndicate, everything looked very rosy at that time?

A.—It did.

Q.—You have the personal knowledge and you are positively certain that a large number of concerns were floated during that period to which were subscribed crores and crores of rupees, and shares were sold like hot cakes in Bombay market, jumping to a substantial premium when the Company was only registered?

A.—That was so.

Q.—That was the condition of things, but several of those concerns have come to grief?

A.—They have, unfortunately.

Q.—And during the last few years crores of rupees of capital have had to be wiped off?

A.—That is so.

Q.—Therefore the mere fact that two substantial syndicates came forward to launch a scheme of that description in the year 1919 does not indicate that the scheme should be pushed through and completed in the time of depression?

A.—No. Might I just say one word on that? I do feel this rather strongly. Between 1917 and 1920, as Mr. Billimoria has pointed out, we all made very serious mistakes, and the lucky ones are those who made the fewest. We have all in our various capacities had to go through the painful process of cutting our losses, and, believe me, Sir, they are cut to a degree, or will have to be cut to a degree, which is very drastic. We have to do the same with regard to this reclamation.

Chairman.—Thank you.

(The Witness withdrew.)

The Committee Assembled at 11 a.m., on the 13th October, 1926, all Members being present.

52nd Witness, Sir L. J. Kershaw, K.C.S.I., C.I.E., Assistant Under-Secretary of State for India.

WRITTEN STATEMENT.

I may, perhaps, be able to assist the Committee by explaining the circumstances in which the Secretary of State for India in Council sanctioned the Bombay Housing and Development scheme. I shall explain, first, that the Back Bay scheme was not dealt with as an isolated proposal, but as an integral part of the larger scheme, and, secondly, that the Secretary of State in Council in dealing with the latter had regard to its administrative and financial aspects. Following the usual practice no part of the scheme was subjected to technical examination.

Throughout the case the governing consideration was the urgent need to improve industrial housing conditions in Bombay, regarding which the Secretary of State had addressed the Government of India by despatch in 1917.

Oral Evidence.

Chairman.—What position were you holding in the year 1920?

A.—I was then Secretary in the Revenue and Statistics Department of the India Office.

Q.—Are you acquainted with the circumstances under which the Secretary of State for India in Council, sanctioned the Bombay Housing and Development schemes?

A.—Yes.

Q.—The Development Directorate, as we have been told frequently, had many other activities besides the Back Bay reclamation?

A.—That is so.

Q.—Was the Back Bay reclamation the principal undertaking in a large number of other undertakings designed to relieve the congestion and to improve the conditions of Bombay?

A.—It depends on what you mean by the " principal " undertaking. It may be considered that the housing scheme was the principal part of the scheme, but it is a matter of opinion.

Q.—That, broadly speaking, is the position?

A.—Yes.

Q.—Will you tell us what were the circumstances under which the scheme was sanctioned?

A.—It is difficult to know where to begin. May I refer to my documents? Perhaps I had better take as the central date the month of February, 1920. In that month we received from the Government of India a letter regarding the Bombay Housing and Development scheme. With that letter the Government of India sent copies of correspondence which had passed between them and the Government of Bombay on the scheme.

Q.—The letter of the 4th February was mainly devoted to finance, was it not?

A.—I am now referring to the letter of the 26th February from the Government of India to the Secretary of State. In that letter the Government of India told us that these proposals had been discussed between the two Governments at Delhi, and they indicated that, broadly speaking, they were in favour of the proposals, but they said that they were then formally before the Government of India, and that we might expect a telegram containing their considered views. That telegram was received the following month, in March. In this letter of February, to which I have referred, the Government of India made it clear that the Back Bay scheme was an integral part of the bigger scheme. We had already received the printed book containing Sir George Buchanan's estimate, and we had also received a telegram from the Government of India on that part of the scheme, in which they said they were satisfied that the scheme was a sound one, both from the technical and financial aspects. On these materials we proceeded to examine the scheme as a whole, and we took advantage of an offer made by the Government of India and consulted Mr. Monie, an officer of the Bombay Government, who was at home at the time. They told us that if there was anything in the scheme which required further explanation, Mr. Monie would be able to supply that information. Accordingly we asked him to come to the India Office to discuss some aspects, especially of the Housing scheme, and those matters were discussed with him. In considering this scheme, the chief matter that seemed to require examination was the adequacy of the Housing scheme. The Housing scheme, as I say (and I want to lay special emphasis on this), overshadowed everything else. It was regarded as a matter of great urgency that the housing conditions in Bombay should be improved. There were also taxation proposals, but we did not altogether accept those proposals. One feature of the scheme involved the taxation of cotton. The Secretary of State did not altogether accept the proposals as sent up by the Bombay Government, and certain suggestions were made. Another important aspect of the scheme was the method of financing it. The scheme involved an expenditure of, I think, 30 crores in the first five years, and it was a matter of great importance to decide the best way of raising the money.

Q.—Thirty crores at 1*s.* 6*d.* is £22,500,000?

A.—Something of that sort; I do not know what the exchange was at that period.

Q.—I am treating it as at 1*s.* 6*d.*?

A.—As the result of this examination of the scheme, a telegram was sent to the Government of India on the 4th May, giving what I might describe as provisional sanction to this scheme. The scheme was sanctioned in principle " subject to a suitable scheme of finance being evolved."

Q.—I think that telegram contained a congratulatory message. Will you read it?

A.—" I desire to acknowledge the admirable work of the Bombay Government in devising the scheme, which is conceived on bold lines, and subject to a suitable scheme of finance being evolved, I am prepared to accept your proposals in principle." Then the telegram proceeds to discuss the question of taxation.

Q.—When the Secretary of State says " in devising the scheme," was that an inclusive reference?

A.—That referred to the scheme as a whole. Just as the Government of India considered that the Back Bay scheme was an integral part of the scheme, so we considered that the Back Bay scheme was an integral part of the scheme—in other words, that housing could not be improved unless the Back Bay scheme was undertaken.

Q.—Is there a reference in the telegram to the sanctioning of the dredging plant?

A.—Not in this telegram. Do you want me to go on to that at once?

Q.—No. Just take the matter in your own way.

A.—That telegram, as I said, contained what I might describe as provisional sanction. Then there followed some correspondence between the Secretary of State and the Government of India regarding the method of financing the scheme, and even though the method of finance was not finally agreed upon, nevertheless in reply to a telegram from the Government of India of the 1st June, in which they represented how exceedingly urgent the scheme was, the Secretary of State gave sanction to the scheme.

Q.—Can you give me the actual date of that? I have a note of it, but I have not the actual date.

A.—The date is the 8th June, 1920. That telegram made some comments on taxation. Have you a copy of it?

Q.—Yes.

A.—The telegram ends by giving " the sanction for which you ask."

Q.—" I give you the sanction for which you ask."

A.—That is general sanction to the scheme. Further discussion on finance followed, and finally, on the 1st September, the Secretary of State sanctioned the issue of a loan on certain terms. That, in outline, is what happened during those few months in 1920.

Q.—So far, the evidence you have given us deals with the administrative and financial aspect?

A.—Yes.

Q.—As regards Back Bay, the technical aspect was a very important matter, was it not?

A.—No doubt, but, following the usual practice in such cases, no technical examination of the scheme was undertaken in the India Office.

Q.—On what is that practice based?

A.—I should say it is based on common sense. I should say that it would be administratively very difficult to adopt any other practice.

Q.—But technical experts exist in England, do they not?

A.—Certainly. May I explain? I say " usual practice." There have been very exceptional cases in which the advice of outside experts has been taken. I have made enquiries and I find that two such cases have occurred. In one case, I believe, the Government of India themselves asked that advice should be taken on the design of a syphon in connection with an irrigation work, and that was done. In another case the papers received (I am now speaking of the Sukkur Barrage scheme) disclosed a very acute difference of opinion between the experts in India, and as the scheme was a very large one, the Secretary of State thought it desirable to set up a special committee of experts to examine the scheme. That was done; their report was sent to India; and another scheme was prepared. Ordinarily, however, no such examination is made. I need hardly say that at the India Office we have not any technical experts on the staff.

Q.—But there would have been no difficulty whatever in submitting the report of Messrs. Lowther & Kidd, the report of Sir George Buchanan, and any other documents to two or three technical experts in this country, would there?

A.—There seemed no necessity to do that.

Q.—My question was that there would have been no difficulty?

A.—Had the Secretary of State thought it desirable to obtain outside advice, he could no doubt have obtained such advice

Q.—Do you know that it was realised by the Government of India that this was a work of a very unusual character?

A.—I am afraid I cannot speak about that.

Q.—Did you realise that the Back Bay reclamation scheme was a work of a highly technical and somewhat unusual character?

A.—No. The scheme seemed a perfectly straightforward one on the papers.

Q.—At all events, it was a very large undertaking to reclaim 1,143 acres on an oper sea front?

A.—No doubt, if you take the scheme as a separate scheme; but the point on which I wish particularly to lay stress is that this was only part of a much bigger scheme.

Q.—Yes, but taking it as part of a much bigger scheme, it was most essential that it should not fail?

A.—Certainly.

Q.—Because, as part of a bigger scheme, a failure would damage the whole bigger scheme?

A.—The same consideration applies to practically every project which is sent up.

Q.—What I am suggesting to you is that there was no precedent in the whole world for a reclamation of this extent on an open seafront?

A.—That, of course, I cannot say. I am not aware of that.

Q.—At all events, the Secretary of State did not subject the proposed reclamation to the consideration of any technical experts in this country?

A.—That is so.

Q.—At this time in 1920 was there, in the opinion of the Secretary of State, an urgent need for something to be done in Bombay?

A.—Certainly. He was very deeply concerned with the condition of things in Bombay in regard to industrial housing. I remember that shortly after Mr. Montagu assumed office he sent a despatch to the Government of India on the subject. We understood that the Government of India were equally concerned, and the Government of Bombay also. As I said before, it was the dominant consideration throughout the case—the urgent need of improving industrial housing in Bombay.

Q.—Even as far back as 1911 were the housing conditions, as far as you know, acute? In 1914 there was a report of the Bombay Development Committee, and a member of the Indian Civil Service, Mr. Kissan, giving a statement, said, " According to the census of 1911, out of the total population of 929,082 people living in 200,308 tenements, 743,247 (that is about 80 per cent. of the total population) live in 166,337 one-roomed tenements "?

A.—That, I understood, was the position.

Q.—Accepting those figures, it shows that even in 1911 the condition of Bombay was dreadful as regards housing?

A.—It was. I think the matter attracted a good deal of attention in Parliament here. I remember in Mr. Chamberlain's time, when a Debate took place on the Cotton Duties, there were some references in the Debate to housing; and I think I am right in saying that a despatch was sent to the Government of India then, not exclusively on housing, but on the question of Cotton Duties, but referring also to housing. The leading document, as I have always understood, was the Report of the Industrial Commission.

Q.—Sir Stanley Reed referred to it the other day. We ought to have that report.

A.—Sir Thomas Holland, who was the Chairman of that Commission, spoke very strongly in the Legislative Council on the state of things in Bombay.

Q.—When you said that Mr. Montagu had sent a despatch on this subject, were you referring to a despatch in the year 1917?

A.—Yes.

Q.—Do you happen to have a copy of that?

A.—Yes, I have it in my file.

Q.—Will you summarise it for us?

A.—This is dated 26th October, 1917. He refers to a despatch sent by his predecessor—that is Mr. Chamberlain—asking to be furnished with a full statement of the case regarding the system of Indian Cotton Duties, and he goes on to say that one aspect of the latter question—that regarding the housing of operatives—" is no doubt engaging your attention. I am glad to observe that H.E. the Governor of Bombay and that members of His Excellency's Government have already, in addressing commercial bodies in Bombay, impressed upon mill-owners their obligation in this respect. My information on the subject is not complete, but from published reports I gather that during the 14 years which followed the passing of the City of Bombay Improvement Act of 1898 some of the worst slum areas were swept away and that the Board of Trustees erected model chawls sufficient to provide accommodation for 17,000 odd persons, the population occupying one-roomed dwellings being then estimated to be 800,000." That more or less corresponds with the figure you gave me.

Q.—Yes, that is right.

A.—" The operations of the Board of Trustees under the Act of 1898 were, in the matter of housing, directed primarily to the provision of accommodation for those rendered homeless by the demolition of insanitary dwellings and not specially for mill operatives, but the amendment of the Act effected in 1912 empowered the Board to co-operate with millowners for the provision of accommodation for the poorer classes of their employees. It was hoped that by co-operative effort, accommodation could be provided for a large number of low paid workers at the expense in the first instance of the State, the rent payable by employers being fixed so as to ensure the payment of the capital cost with interest in 28 years. These anticipations do not seem to have been realised, and I understand that up to the end of 1915-16 only one scheme for the erection of eight blocks had been taken up and partially completed, the second scheme having been under consideration for nearly two years. I have not been able to ascertain the causes which have hindered the more effective operation of the Act, nor have I the information as to the extent to which employers may have themselves provided suitable accommodation for their workpeople, but unless this has been done on a large scale the position is highly unsatisfactory and demands immediate and energetic action. The Bombay millowners may have derived considerable advantage from the increase in the Cotton Duties, and if that be the case they have failed to realise their obligations, or the existing legislation being inadequate, it would appear to be necessary that the Government or the local authority should be vested with larger powers than they at present possess on the principle of the Housing Acts in this country. It may be remarked that experience of housing difficulties in this country indicates that private enterprise in itself cannot be relied on to provide an adequate remedy. I request that Your Excellency's Government will obtain from the local authority a report on the housing of mill operatives in Bombay, describing the existing situation and indicating the measures which the local authority propose to adopt. The matter is one in which early action appears to be desirable, and I shall be glad to learn your views and those of the Bombay Government at an early date."

Q.—That shows the serious view which Mr. Montagu took of the matter in 1917. The Governor at that time, 1917, was Lord Willingdon. Sir George Lloyd succeeded Lord Willingdon on the 16th December, 1918. When Lord Lloyd became the Governor-Designate, he would, I suppose, in practice, attend at the India Office so as to acquaint himself with the problems with which he would have to deal?

A.—Ordinarily he would.

Q.—I say, according to the usual practice?

A.—Yes.

Q.—The Governor-Designate goes to the India Office and is told what are the immediate problems with which he will have to deal on becoming the Governor?

A.—Yes.

Q.—Therefore in the ordinary course would it be fair to assume that Lord Lloyd would see that despatch?

A.—I cannot say whether he saw this particular despatch or not.

Q.—Would it be fair to assume that, in conversations with Mr. Montagu, the urgency and importance of dealing with the housing question would be pressed upon him?

A.—That is the case. I have a note in one of our files by Mr. Montagu in which he said, " The land trouble in Bombay is shocking. I charged the Governor on appointment to deal with it urgently."

Q.—What is the date of that?

A.—That is dated April, 1920.

Q.—Is the actual day of the month given?

A.—It was not his practice to put the date, but from internal evidence I think I am safe in saying that it was the 6th April. It is on or about that date.

Q.—I will tell you why I asked the question, Sir Louis. It is because the Government of Bombay had on the 16th October, 1918, sent a telegram to the Secretary of State saying that the re-examination of the Back Bay scheme was urgent and asking that the best man should be sent to Bombay?

A.—Asking the Secretary of State to obtain an expert?

Q.—Yes. That was on the 16th October, 1918. No reply had been sent to that telegram, and on the 8th April, 1919, when Lord Lloyd was Governor, a second telegram was sent.

A.—By whom?

Q.—By the Governor of Bombay.

A.—To what effect?

Q.—Stating that there was no reply to the wire of the 16th October which had been sent by Lord Willingdon—" so wire again. Expert must see the conditions before monsoon as well as after. Government of India agree with Government of Bombay that expert should reach Bombay not later than the third week in May."

A.—Do you want me to go into the details of that?

Q.—No. The only point I wish to make is this. I wish to emphasise that it was Lord Willingdon's Government which, on the 16th October, 1918, had stated that the re-examination of the Back Bay scheme was an urgent matter. Lord Lloyd, before going out in December, 1918, is, as you have shown us by that note, pressed with the urgency of the housing schemes. Then on the 8th April his Government carries on the cabling which had commenced on the 16th October?

A.—That all seems to fit in.

Q.—This Back Bay reclamation scheme cannot, in view of those telegrams, be suggested to be the initiation of Lord Lloyd?

A.—Oh, no. I always understood that the Back Bay scheme had a very long and chequered history behind it.

Sir M. Visvesvaraya.—You have already stated there was an understanding when Lord Lloyd left England that he should proceed with the development schemes?

A.—Yes—well, not with the development scheme, but he was pressed with the importance of the question of industrial housing. Of course, one is connected with the other.

Q.—He was pressed with the importance of pushing on with questions connected with the development of Bombay?

A.—I did not say so.

Q.—That was the object—the development of Bombay?

A.—I should not say so at all. You might develop Bombay for a variety of reasons, but the matter which was pre-eminently in the mind of the Secretary of State was the improvement of industrial housing in Bombay—which, of course, was linked up with the easing of the land congestion in Bombay, which, in its turn, was linked up, I presume, with reclamation.

Q.—There is a letter from the Government of Bombay to the Government of India, dated the 24th May, 1920.

A.—Did the Government of India ever communicate that letter to the Secretary of State? What was it about? Perhaps I may be able to trace it if you tell me that.

Q.—It is about the extreme urgency of the case; but I will not refer to it. There is a telegram from the Viceroy to the Secretary of State dated the 1st June, 1920, at the end of which it says: " Some risk must be run in order to end the present intolerable condition of affairs." There are similar statements made in the other letter.

A.—May I read the whole of that passage: " Some risk must be run in order to end the present intolerable condition of affairs, and we earnestly solicit orders which will enable Sir George Lloyd's Government to commence operations, and assure you that every endeavour will be made," and so on, " which are equally present to our minds." That is the telegram to which I have referred on which final sanction was given to the scheme.

Q.—" I am to emphasise strongly the point that it is essential, if possible, to put an end as early as possible to the misery and hardship caused by the present conditions." That is in the letter to which I first referred. That statement is made by the Government of Bombay. The scheme seems to have been rushed with more than ordinary haste on that occasion, does it not? I presume they considered that the housing conditions were very unsatisfactory?

A.—Are you speaking of the Government of Bombay, or of the Government of India, or of the Secretary of State?

Q.—I am speaking of the Government of Bombay. Were any communications also sent to His Excellency the Viceroy to make things easy for the new Government in this respect?

A.—I do not understand what you mean by " making things easy."

Sir M. Visvesvaraya.—Up to 1917 other schemes of reclamation had been submitted by the Bombay Government one after another, and they had all been turned down by the Government of India.

Chairman.—From 1863.

Sir M. Visvesvaraya.—And it was only on this occasion in 1919, as soon as the proposals from the Government of Bombay went up to the Government of India, that the latter viewed the question favourably and gave every facility to the Government of Bombay. I only want to know whether there is any record of the Viceroy having been influenced by the Secretary of State?

A.—I do not understand. I am not evading the question in any way, but I do not understand what you mean by " giving facilities."

Q.—Did the Secretary of State send any communication to the effect mentioned to the Viceroy?

A.—Privately or officially?

Q.—Privately or unofficially?

A.—I cannot speak as to any private communication. There is no official communication

Q.—You have referred to one note. Is there any similar note or similar reference on your file?

A.—Do you mean after 1919?

Q.—Yes.

A.—No. I think I am right in saying that there is not.

Q.—They changed their usual policy of caution in this respect in 1919?

A.—That, again, is a matter of opinion.

Q.—You have stated that you are concerned only with the administrative and financial aspects of this question?

A.—No. What I said was that in considering the case special regard was had to those aspects

Q.—You do not usually get such schemes independently examined here, I take it?

A.—No, it is very exceptional.

Q.—But this was also an exceptional scheme, was it not? I am only asking for information?

A.—I do not think I have made myself clear. It is only when there is some exceptional circumstance in the scheme, such as the instance I have given in which there was a difference of opinion between experts in India. Obviously then the Secretary of State can hardly take the responsibility of sanctioning without satisfying himself.

Q.—The Government of India approved of the scheme, not by despatches or by official communications, but because an engineer was sent from the Government of Bombay to the Government of India to assist the Public Works Department's engineers and the Government of India, and also Mr. Monie was sent to the Secretary of State to explain matters.

A.—Mr. Monie was not sent specially. He happened to be in England on leave, and it was suggested that he might explain the scheme.

Q.—In another case the Secretary of State wired to the Viceroy on the 4th May : " I have been seriously embarrassed in dealing with this case by the manner in which the proposals have been submitted in a scheme of this magnitude involving many novel features. In the absence of a self-contained description of proposal I have been forced to rely on correspondence passing between you and the Government of Bombay since September last." This is a statement made by the Secretary of State to show that the scheme was pushed on with more than ordinary speed?

A.—A think if it had not been an excessively urgent scheme, a scheme of this kind would have come up in the ordinary way with a long despatch with a self-contained description, but the Government of India explained in their letter that they had discussed the matter with the Government of Bombay and were actually considering it at the time. Therefore it was sent to us in this form, I suppose, on account of the urgency of the case. It made it more difficult for us to examine the scheme, but that was the reason.

Q.—Do you consider, viewing it from the present position of affairs, whether the question was really so very urgent at that time, in regard to housing conditions?

A.—I can only give you my personal opinion, but I certainly think it was very urgent.

Q.—Have things been remedied since in that respect?

A.—You probably know the facts better than I do.

Q.—We want your view from this distance?

A.—At this end we are constantly having to meet criticisms in Parliament and so on. We are able to say that so many chawls have been built under this scheme. I am not in a position to say whether the scheme has been a success or not. I am talking now of the housing scheme; which no doubt has eased the position.

Q.—You have seen a recommendation made that Messrs. Meik and Buchanan should be the sole engineers for ordering the dredgers, for preparing the specifications and so on. You have seen the recommendation made by the Government of Bombay?

A.—Yes.

Q.—There is a telegram from the Viceroy to the Secretary of State dated 12th June, 1920: "Our telegram dated 19th May, position of Meik and Buchanan in relation to Director-General of Stores, India Office," etc. (reads telegram). That was approved, I believe, with modifications, by the Secretary of State?

A.—I am not very familiar with this side of the case.

Chairman.—The Secretary of State refused to accept that, and demanded a joint responsibility?

A.—I think Colonel Paddon has given evidence on this.

Chairman.—Yes. We have had that evidence.

Sir M. Visvesvaraya.—There was another recommendation from the Government of Bombay, viz.: that Messrs. Simons and Company should be entrusted with the order for the dredger. They went into the tenders and they recommended to the Secretary of State that Messrs. Simons and Company's tender should be accepted. You have some reference to that, have you not?

A.—So far as the dredger is concerned the Secretary of State gave sanction for placing the contract. I cannot give you any information about the details.

Chairman.—We have had them from Colonel Paddon; but we shall want you some time this morning to tell us about the sanctioning of the dredging plant, and the order. That was some time in May?

A.—Do you wish me to go into that now?

Sir M. Visvesvaraya.—Yes, if you will.

A.—The dates are important. The telegram of the 4th May to the Government of India said: "In anticipation of sanction to the main scheme for Bombay development I have sanctioned the placing of the contract for the dredger." Although it is quite true that it was in anticipation of the sanction, it is not absolutely true, because if you compare the date of the telegram which conveyed provisional sanction to the scheme, you will find that it was then decided that the scheme would be accepted subject to the settlement of financial details; and, of course, there was no reason to suppose that those details would not be settled.

Chairman.—The finance telegram was on the same day?

A.—The two things were settled at the same time.

Sir Frederick Hopkinson.—But the scheme was sanctioned on June 8th, was it not?

A.—Finally.

Q.—It was provisionally sanctioned on 4th May and finally sanctioned on 8th June?

A.—That is right. You will notice that the date of this telegram relating to the dredger is the 4th May. As a matter of fact, the two telegrams were submitted at the same time after the whole case had been considered, so that although it is technically correct to say it is in anticipation of sanction, in reality the provisional sanction had then been given, or was given on the same day, to the main scheme.

Q.—Because, by sanctioning the purchase of the dredging plant, you sanctioned the scheme. You committed yourself to the scheme?

A.—I am afraid I have not made myself clear. The scheme as a whole was considered from various angles and discussed, and it was decided to sanction it, subject to a suitable scheme of finance being devised. I have already explained that discussions followed on that subject. At the same time as the scheme was sanctioned, and as it was certain that a method of finance would be devised, it was decided to sanction the placing of the contract to get on with the work. That, I think, was the sequence of events as far as I can understand it from the papers.

Chairman.—Sir Frederick Hopkinson's point is that once you had sanctioned the expenditure of £650,000 for the purchase of the dredger you were committed to the scheme?

A.—Yes. We had already committed ourselves. It was simultaneous.

Q.—The scheme was provisionally sanctioned subject to finance, as to which it was anticipated there would be no difficulty?

A.—I think I am right in saying that. The Bombay Government had proposed premium bonds, and the Secretary of State did not feel prepared to accept that. Discussions with Bombay resulted in a loan on certain terms being floated in Bombay.

Sir M. Visvesvaraya.—The Government of Bombay wrote to you that Messrs. William Simons & Co.'s tender should be accepted for the dredger. There is a letter addressed by the Government of Bombay to you?

A.—You are taking me out of my depth now.

Chairman.—Colonel Paddon has produced the letter. It is quite clear in its terms —that the Government of Bombay did indicate Messrs. Simons as the builders of the dredger.

A.—I am afraid I can give no evidence of any value on the details of the purchase of the dredger. I am merely concerned with the sanctioning of the scheme and of the placing of the contract.

Chairman.—There is no controversy about it.

Sir M. Visvesvaraya.—I want to bring out the point that in many respects both the Secretary of State and the Government of Bombay facilitated the transactions.

A.—Undoubtedly. What do you mean by " the transaction "?

Q.—The development scheme.

A.—By " the transaction " I mean the scheme as a whole.

Q.—That would mean facilitating each detail as it came up. On another occasion Messrs. Meik and Buchanan were allowed to submit tenders direct to the Director of Stores, were they not?

A.—I cannot say anything about that.

Q.—There were no instructions to the naval architect to facilitate matters, I take it; or are you not aware of that?

A.—I am not aware of any instructions. I have no doubt that he was aware of the urgency of the work.

Q.—In the course of the evidence we have found that certain formalities which ought to have been gone through were not gone through, due to the urgency of the scheme?

A.—I do not know that I can give any useful evidence on that.

Sir Frederick Hopkinson.—I think you said the shortage of houses was very acute in 1911?

A.—I think the Chairman said that. He read an extract from a report.

Chairman.—I read the conditions mentioned by Mr. Kissan.

Sir Frederick Hopkinson.—I thought the witness gave general concurrence.

Chairman.—The conditions in Bombay were quite serious in 1911, before the war and before the immigration in 1916 onwards.

Sir Frederick Hopkinson.—And presumably that congestion of population and shortage of houses would not get less acute up to 1919?

A.—I presume not. I do not know anything about the conditions in those years.

Q.—We have been told that the population of Bombay nearly doubled itself. There was an immigration of something like 600,000 people. Was not this a very sudden development of the Back Bay scheme early in 1919? Was it not a complete reversal of everything that had gone before in regard to the suddenness with which this scheme was inaugurated?

A.—I should not think so.

Q.—This Back Bay reclamation had been almost a hardy annual since 1863. Time after time it was considered and nothing was done, or very little, up till 1919?

A.—You are more familiar with the history of it than I am, but we understood that a project had been worked out at about 1912 by Mr. Kidd, and that it was then represented, I think by Lord Willingdon's Government, that it was urgently necessary to re-examine it. It seems to me the two things fit in.

Q.—But nothing had happened between 1912 and 1919 apparently?

A.—The war had happened.

Q.—But nothing in the way of going on with the scheme of the Back Bay reclamation?

A.—No. So far as I know nothing was done.

Chairman.—At the same time, Sir Frederick, you would like to include the fact that two syndicates were willing to put up a very considerable sum of money in December, 1917, as evidencing the belief of very hard-headed and very important business people in Bombay that there was money in the reclamation.

Sir Frederick Hopkinson.—Having regard to the present condition of affairs at Bombay—that is, with regard to the Back Bay reclamation—do not you think that if they had made haste a little more slowly things would have been better?

A.—Well, it is always easy to be wise after the event, but we have to look at things as they were at the time and on the materials available at the time.

Q.—You know the old proverb of " More haste less speed "?

A.—True.

Q.—If they had perhaps had a little less haste there would have been more speed and the scheme would be in a better condition than it is in to-day?

A.—It may be so, but I am, and I presume you are also, dealing with conditions as they were round about 1920.

Q.—What I do not quite understand is the suddenness with which the scheme was pushed forward in 1919?

A.—Sudden in what way?

Q.—In every way. The engineer was appointed in May, 1919. He spent a short time in Bombay. He left on 31st May. His report was sent in early in September, 1919. The dredger was ordered in May, 1920, entirely on this one report of Sir George Buchanan. I suggest that that was making haste too rapidly.

A.—Well, I do not think I agree with you, but it is a matter for you yourselves to consider.

Mr. Billimoria.—When you refer to the financial question being discussed, it was with regard to the method of raising a loan; but that does not necessarily deal with the soundness or otherwise of the scheme?

A.—No. By the financial aspect of the scheme I meant it was chiefly concerned with the method of raising money during the first five years.

Q.—The Government of Bombay proposed premium bonds, and the Secretary of State would not entertain that proposal, and so on?

A.—That is right.

Q.—The Secretary of State did not consider whether the scheme was financially sound or otherwise. That consideration was not given to the scheme?

A.—No. I want to lay stress on the point that the scheme was not regarded as a commercial undertaking estimated to cost so much or estimated to yield so much. It was regarded as a scheme to deal with this scandal in Bombay. It was regarded, certainly, in that light by the Secretary of State and no doubt also by the Government of India and by the Government of Bombay.

Q.—When the scheme was submitted, certain figures were also submitted to the Secretary of State. It was stated that it was possible to have this scheme completed at an estimate of 367 lakhs. That was the basis on which the Government of India were induced to carry on with it, and that was also the reason which actuated the Secretary of State in approving of and sanctioning the scheme?

A.—By the scheme, are you referring to the Back Bay scheme?

Q.—Yes.

A.—I have already laid stress on the fact that we did not treat the Back Bay scheme as a separate scheme but as a part of a much larger scheme. That larger scheme was treated as a whole. It included, as you know, not merely industrial housing and not merely Back Bay. There was another reclamation scheme, suburban development, and so forth.

Q.—As far as the Back Bay scheme is concerned, there was direct correspondence between the Secretary of State and the local government?

A.—Yes, regarding the choice of an expert.

Q.—Not only regarding that, but with regard to the scheme itself?

A.—Not between the Secretary of State and the Government of Bombay. I do not think so; I may be wrong.

Q.—The report of the expert was submitted. The Secretary of State was requested to look out for some expert who could go out to India and give an opinion on the feasibility or otherwise of the scheme?

A.—That is so.

Q.—Therefore, although it was considered as a part, it was considered separately?

A.—In that sense; but the fact that the Government of India or the local government asks the Secretary of State to recruit an expert has no connection with the sanctioning of the scheme afterwards.

Q.—If the Bombay Government had not mentioned that the scheme was going to cost 367 lakhs but was going to cost much more, would the Secretary of State have sanctioned the scheme.

A.—That is a hypothetical question on which I cannot give an opinion. I do not think I ought to give a personal opinion.

Q.—Was not the money part one of the considerations, apart from the congestion and the tension which was felt? You could not have undertaken a large scheme of this magnitude without due regard to finance. The financial position was also one of the factors to be considered, was it not.

A.—One of the factors.

Chairman.—I think what Mr. Billimoria wants to know is this. As far as you know, was the Secretary of State influenced by the fact that apparently this large reclamation could be done for a relatively small sum of 367 lakhs? That is one question. The other question is: was finance a governing consideration, or were other considerations the governing ones?

A.—Well, as to the first part of the question: when the scheme as a whole was examined the Back Bay part of the scheme was regarded, on the materials presented, as a very attractive proposition. It was estimated to cost so much and estimated to yield so much. I do not for a moment say—I can only here give my personal opinion—that that was a determining factor, or even a contributing factor, in influencing the decision. I have said before, and I repeat it, that the dominant consideration was the urgent need of improving the industrial housing conditions in Bombay. Whether or not if the scheme had been estimated to cost, let us say, twice the amount that was stated, the Bombay Government would have sent it up, or the Government of India would have sent it up, or the Secretary of State would have sanctioned it, is a matter of opinion.

Q.—No one can tell?

A.—No one can tell.

Sir Frederick Hopkinson.—Did you know that it was stated in the House at Bombay that this was going to produce a profit of 32 crores?

A.—I do not remember the figure.

Q.—It would be enormously profitable?

A.—Certainly; taken on the basis of land values at the time, it was a very attractive proposition; but I want to make it clear that the fact that the Back Bay scheme as presented was an attractive proposition was not the determining feature in the case.

Mr. Billimoria.—It was one of the considerations?

A.—It was no doubt a consideration.

Q.—Not predominant, but one of the factors?

A.—I want to make it clear that it was not a dominant consideration. I want to make that perfectly clear.

Sir Frederick Hopkinson: There is not so much connection between the Back Bay scheme and housing as you might think, because the Back Bay reclamation was not going to provide housing for the working classes?

A.—That is clear. Possibly you may take evidence from somebody with greater knowledge of Bombay than I have on that.

Q.—I was just bringing to your notice that the Back Bay reclamation was not intended to supply houses for the working classes?

A.—Not directly, but surely—at least, we understood so—the reclamation of this large area would ease the congestion in Bombay.

Q.—But not the housing of the working classes?

A.—As I say, evidence from somebody familiar with Bombay conditions would be more valuable than my evidence on that point.

Sir Frederick Hopkinson.—We have had witnesses who have tried to connect the two.

Chairman.—It is a long chain.

Sir Frederick Hopkinson.—It is a long chain.

Chairman.—In fact, it is a very long chain.

Sir Frederick Hopkinson.—The one is very remote from the other.

Chairman.—But regarding it as an attractive proposition, as was said in the Legislative Council, whatever profit was realised could be applied to the amelioration of the working classes?

A.—Yes.

Q.—It can be applied for the building of houses for the industrial population?

A.—Yes.

Mr. Billimoria.—The congestion of housing was a dominant consideration, you have stated, at the time; but was the reclamation linked up with it except on this point that it was going to [illegible] very handsome profit which would go to relieve this congestion?

A.—No; it was not regarded from [illegible] point of view. We have just been discussing that.

Q.—How does the Back Bay scheme come into that?

A.—I say I cannot speak with any local knowledge of Bombay worth anything. If you take evidence from people acquainted with Bombay then they may be able to trace the connection. We knew, of course, that tenements were not going to be erected on the reclaimed land at Back Bay. That was clear: but we understood that the throwing open of this large area would ease the conditions in Bombay and so enable tenements to be built.

Q.—Did you expect that by the reclaimed area congestion, with reference to industrial housing would be eased?

A.—Well, of course, any question of congestion is a fluid proposition. It is not that site, or this site, or the other site. Here I am rather going out of my province, but I should have thought that when you have acute land congestion in a town, if you rendered available a large area, it would ease the condition of things all round. I should imagine so.

Q.—I will not press that, because we have had evidence of other people on that.

A.—You will probably take evidence about it.

Q.—With regard to the note of Mr. Montagu which you produced, I find it is undated. Can you explain why it is undated? If you look at the file you will observe it is not dated at all.

A.—I can fix the date, because the note is on a file which was put forward on a certain day and disposed of on a certain day, so obviously between those two dates the note was written. Do you attach any importance to the date?

Q.—No; but because I happened to read in the files this document and it is undated, I thought possibly you might be in a position to clear up the circumstances under which this note was not dated. It is a very important note, and it has a very great bearing on this question.

A.—If you have any doubts in your mind, I can resolve them.

Q.—It is not a question of doubts in my mind. It is a question of the date. It is an important document for it not to be dated.

A.—Here is the original of the note. I have got it in front of me. What I was reading from was a typed copy, because the original note is rather illegible. The case was put forward by me on the 31st March in the ordinary way and dealt with by the Under-Secretary of State on the same day, and the final telegram was sent on the 8th June, so the note was written between those two dates. From the fact that I see "E.M.S. 6.4" I am presuming it was the 6th of April.

Chairman.—Then it is dated?

A.—Well, no; because the "E.S.M." is not written in Mr. Montagu's writing. Probably it is his private secretary's writing. There is no doubt whatever it was written within those two dates.

Q.—It indicates the 6th of April as the date?

A.—That is the date I gave you before.

Mr. Billimoria.—Was that before His Excellency was appointed Governor of Bombay?

A.—Was what before?

Q.—This note of the 6th April that you are referring to

A.—It is the 6th April, 1920—it was long after.

Mr. Billimoria.—How then does the note read that: "I charge the Government."——

A.—It is "charged."

Q.—In our copy it is "charge." It is not the past. It is "charge."

A.—I am sorry. That is wrong.

Q.—Then this must have been discussed before his Excellency took over charge of his office as Governor, and Mr. Montagu put the note later on.

A.—That appears to be the case.

Q.—Do you know the circumstances under which Sir George Buchanan happened to be appointed engineer in connection with this reclamation—as to how he was selected?

A.—I think the selection was made by the Government of Bombay, was it not?

Q.—Yes. The Secretary of State was asked to recommend some engineer, and in the meantime Sir George Buchanan was appointed.

A.—I think what happened was the Secretary of State was asked to obtain an expert, and the particular expert we thought would be suitable was unable to go to Bombay before the monsoon.

Sir Frederick Hopkinson.—It was stated that he could not be there till October.

A.—Yes; as the matter was regarded as urgent the Government of Bombay, with the knowledge and approval of the Government of India, then appointed Sir George Buchanan. I think that is what happened. [illegible] is s

Sir Frederick Hopkinson.—There is a little difficulty about the date of that appointment because I think the Secretary of State did not approve the appointment of Sir George Buchanan until May 30th. I think the Government of Bombay cabled on the same day that they had appointed Sir George Buchanan, and he was proceeding with the preparation of the scheme. Is not that so?

A.—I am afraid I will have to look up the documents.

Chairman.—I can give it to you a little more closely. On the 7th May the Government of Bombay tells Sir George Buchanan that they will want, or may want,

his services. On the 19th May he arrives at Bombay, and on the 26th May the Government of Bombay wires because of the difficulty of getting Sir Sydney Palmer they have appointed Sir George Buchanan. On the 26th May they say: "Because of the difficulty of getting Palmer decided to employ Sir George Buchanan who is at present engaged on the work, and will probably go home to make enquiries with regard to the dredging plant and material." Those are the dates.

A.—I have got those dates.

Sir Frederick Hopkinson.—There is a note somewhere which says that he is going home the next day.

Chairman.—That is a letter.

Sir Frederick Hopkinson.—I cannot find it at the moment, but there is such a note. So, apparently, Sir George Buchanan on 19th May arrived, and the Government of Bombay decided to employ him on the 26th May.

Chairman.—No; they announce it as a fact: "The Government decide to employ Sir George Buchanan who is at present engaged on the work," which points clearly to the fact that he began about the 19th or 20th of May. It was submitted as an accomplished fact.

Mr. Billimoria.—I want to find out whether the decision rested with the Government of Bombay or with the Secretary of State with regard to a scheme of such magnitude.

A.—The decision regarding what?

Q.—The appointment of an engineer. Before Sir George Buchanan was appointed was the Secretary of State consulted?

A.—No. As the Government of India said and were careful to say, the appointment of an expert to examine the scheme did not commit anyone to accept the scheme. It was quite in the ordinary course of business that either the Government of India or the local Government would ask the Secretary of State to obtain the services of an expert, just as they might ask the Secretary of State to recruit an officer. When the Secretary of State was asked, as has been explained, Mr. Palmer was thought to be suitable; but we told the Government of Bombay that he could not get out before October. Then we received this telegram which the President has just read, and the matter dropped.

Q.—You would agree with me that the success of any scheme would depend very largely upon the expert advice?

A.—But there was no reason to suppose that the expert advice which the Bombay Government had decided to obtain was unsatisfactory.

Q.—But before the formal sanction or approval of the Secretary of State was given to the scheme the question of investigation was also a material point for the consideration of the Secretary of State, was it not?

A.—Investigation had taken place by Sir George Buchanan; that is, by the expert who had been selected by the Government of Bombay and the Government of India. That examination had taken place, and on that that particular part of the scheme was based.

Q.—If you will pardon me, provisional sanction was given on the 4th of May.

A.—Yes.

Q.—Sir George Buchanan's appointment was not till the 19th of May.

A.—Is that so?

Chairman.—You are mixing up two years. It is the 7th May, 1919, that the Government of Bombay indicate they want his services, and it is 4th May, 1920, that provisional sanction is given.

Mr. Billimoria.—I beg your pardon. Then, being corrected as to these dates, did the Secretary of State see at how expert advice was proper advice before launching on the scheme?

A.—No; the scheme was d[illegible] yield a [illegible] and considered as an ordinary scheme which had been prepared by a competent [illegible]rt and examined by the Government of India. There was no reason, as I have explained before, to depart from the usual practice of obtaining expert advice.

Q.—Did the Secretary of State know that some members of the Government of India did not favour the appointment of Sir George Buchanan?

A.—I know nothing of that.

Q.—And that they did not think at all highly of him as to his qualifications and experience?

A.—As to that I can say nothing. I have no knowledge of that.

Q.—Had that fact been disclosed, would the Secretary of State have departed from the rule of not appointing another expert?

A.—That, again, is a hypothetical question that I cannot answer.

Q.—Could you tell me the circumstances under which the order was placed with Simons?

A.—No; I have already told the Chairman that I have no knowledge of the details of placing the order. Colonel Padden will give you all the information on that, if he has not already done so.

Q.—Is it not usual for the Secretary of State to interfere in that?

A.—That is a matter of Stores' administration which I am not very familiar with. It is now dealt with by the High Commissioner, as you know.

Chairman.—Thank you very much.

(The Witness withdrew.)

53rd Witness, Mr. Llewellyn W. Lewis, called and examined.

Chairman.—What are your Christian names?

A.—Llewellyn William.

Q.—I think you have come over here at considerable physical inconvenience?

A.—Yes.

Q.—You have sustained an injury to your knee?

A.—Yes.

Q.—Were you Chief Engineer to the Back Bay Reclamation Scheme from the 11th December, 1920, to the 12th July, 1924? You may take that date from me, I think?

A.—About that. I was connected with it before that.

Q.—You were Chief Engineer from the 11th December, 1920?

A.—I was.

Q.—There was a period from May to October of 1922 during which you went on leave?

A.—Yes, I was on sick leave.

Q.—When did you first hear from anyone that it was proposed that there should be a reclamation in the Back Bay area?

A.—I first heard of it in either January or February, 1920. I was in Rangoon and Sir George Buchanan was passing through Rangoon at the time, and he came to see me and he mentioned the fact that he was engaged on a scheme.

Q.—You were a member of the Public Works Department?

A.—I was.

Q.—You were at one time working at the Rangoon River work?

A.—I was on the Rangoon River training works.

Q.—Had you any previous experience of reclamation on an open sea front?

A.—Well, I had had experience on an estuary, the Faó, on the Shatt-el-Arab, and I have had a good deal of experience of reclamation in Basra itself.

Q.—For the moment my question was confined to an open sea front—by that I mean an area subject to tides?

A.—All those areas were subject to tides.

Q.—Was the Basra area subject to tides?

A.—Yes.

Sir Frederick Hopkinson.—They were not open sea fronts?

A.—They were not open sea fronts.

Chairman.—River training at Rangoon means moving the river in some desired direction?

A.—Yes.

Q.—In Mesopotamia you were principally concerned in building wharves at Basra?

A.—Yes, up to January, 1918.

Q.—Is Basra some 30 miles up the river?

A.—I think 30 miles, but I am not quite sure. I think it is in the neighbourhood of 30, but I could not say off-hand.

Q.—So that, in fact, as regards reclamation on an open sea front, you had had no previous experience of that?

A.—Not on an absolutely bare coast, no.

Q.—Were you nominated for this post by Sir George Buchanan?

A.—Yes.

Q.—You had been in association with him in Rangoon?

A.—Yes.

Q.—And also in Mesopotamia?

A.—Yes.

Q.—I suppose we are entitled to assume that he would not have nominated you unless he had every confidence in your ability to carry out the matter?

A.—I presume not. As a matter of fact I was looking at the letter which he wrote to me in which he asked me to take on the job.

Q.—Have you got this letter?

A.—I have not it with me here.

Chairman.—We have not got that, Mr. Ewbank?

Mr. Ewbank.—No, Sir.

Witness.—It was a private letter.

Chairman.—Will you continue?

A.—He said he knew no one whom he would sooner have than myself to carry out the work

Q.—He was to be the Engineer. This was an enormous undertaking?

A.—Yes.

Q.—Therefore in his own interests he would choose somebody in whom he had very great confidence. Have you seen any evidence which has been given. Apart from anything in the Press have you seen any of the shorthand note transcript?

A.—No.

Q.—Before you became Chief Engineer were you engaged in London on the preparation of the plant?

A.—Yes.

Q.—Would that be about August, 1920?

A.—About that.

Q.—Were you working in Sir George Buchanan's office?

A.—Yes.

Q.—By that time had the partnership of Meik & Buchanan been entered into?

A.—I think so. I am not certain but I have always understood that the partnership then existed.

Q.—The point is this. Sir George Buchanan and Mr. Meik went into partnership at some date after the arrangement with the Government of Bombay had been come to?

A.—I did not know that.

Q.—Was Mr. Meik in the office then?

A.—Yes.

Q.—Then you may take it that the partnership of Meik & Buchanan was established when you were there in August, 1920. In a work of this character which was estimated to cost between £2,000,000 and £3,000,000—that was the original estimate of 367 lakhs—is not it essential that there should be a most careful and accurate provision of plant?

A.—Yes.

Q.—A contractor before giving a price for a work of this character would estimate, would he not, the quantities of cement, the quantity of rolling stock, the quantity of steam shovels and those sort of things that he would require?

A.—Yes.

Q.—Who drew up the original statement of plant that was required—do you remember?

A.—I think I did it myself mostly in consultation with Mr. Meik at that time. Sir George Buchanan left for South Africa, I think, on the 25th August, so I had not the advantage of Sir George Buchanan's advice. When I consulted anybody it was usually Mr. Meik.

Q.—Did Sir George Buchanan leave for South Africa a few days after you came into the office?

A.—Well, I cannot remember the dates. I got to London sometime in July, but I am not quite sure.

Sir Frederick Hopkinson.—You thought before that you began the preparations for the plant list about August, 1920?

A.—That would be so. I do not think I began the plant list immediately. There was a question of seeing how the scheme was going to be worked out and what plant would be required.

Chairman.—Substantially was the amount of plant that was decided on settled by Mr. Meik and yourself. Is that substantially right?

A.—I think so.

Q.—Will you tell us what information you had that would enable you to decide on the quantity of plant and on the quantity of material. Had you anything more than Sir George Buchanan's report?

A.—No.

Q.—With nothing more before you than Sir George Buchanan's report could anyone make more than a rough estimate of the plant and material required?

A.—Well, we had certain things laid down. I think it was possible to gather from Sir George Buchanan's report, for instance, what tonnage of rock was to be sent down per day.

Q.—The arrangement was 1,000 tons per day?

A.—Yes.

Q.—You ordered sufficient wagons for that purpose?

A.—Yes.

Q.—Then in less than 18 months the tonnage became 2,000 tons a day and you ordered another 106 or 126 wagons?

A.—Yes.

Q.—That is one of the questions which I will put to you in detail a little later on, to suggest, not through any fault of yours in the least, that when you went into Sir George Buchanan's office in August, 1920, you were working practically upon Sir George Buchanan's report in framing the amount of the plant, the character of the plant, and the quantities that were required?

A.—Yes.

Q.—And that document by itself was not of a character which would enable you to make anything like an accurate estimate of plant and material?

A.—Well, I think that in working we did not absolutely take it. We elaborated it. His report was not a fully detailed report as regards items and that sort of thing. It was a report to the Bombay Government more of a general character.

Q.—That is quite right.

A.—And my work consisted very largely in those days of scheming out how the work should be done and scheming the plant that would be required to carry out that work in that way.

Q.—For instance, did you have any document showing you in detail how the 367.61 lakhs was arrived at by Sir George Buchanan?

A.—I have never seen anything more than his report as regards that point.

Q.—As regards the dredging plant, that had been already ordered?

A.—It had already been ordered before I got to London.

Q.—You were therefore concerned with a plant that would be required for the Kandivli quarry?

A.—Yes.

Q.—The material that would be required for the building of the sea wall?

A.—Yes.

Q.—The laying out of the railway at Colaba to Marine Lines?

A.—Not at that time—that came afterwards.

Q.—How did it happen that that came afterwards?

A.—Because when we started out the idea was that the first 8,000 feet of sea wall from the Colaba end were to be done by contract. When, I think, in the beginning of February, 1921, Sir George Buchanan reported on the tenders that came in, he reported to the effect that none of these tenders should be accepted, and then I was informed that I had to carry out the work from both ends. That meant doubling the amount primarily of rock that had to be got out and sent down to Bombay. It was a change of policy.

Q.—You are not concerned with the decision, but I am asking you as an engineer: Was not it a change of policy that did not make for economy?

A.—Well, to give an absolute opinion on that would mean a great deal of working out.

Q.—Let us see if we can get an opinion. The original idea was to begin the sea wall at the Colaba end and carry it along on a course for about 4½ miles, was it not, joining up with Marine Lines?

A.—No, it was intended always that the work should be carried out from Marine Lines end departmentally.

Q.—That is right. What misled me was the numbers have been altered. The numbers on that map are not the same as the numbers Sir George refers to in his letters. The original plan was to begin from Marine Lines?

A.—Yes.

Q.—The point I want to make is this. Beginning from Marine Lines the original intention was to build a certain section of the sea wall and then to close that section in with a crossbund, so that you got an entirely enclosed lagoon. That was the original intention, was it not?

A.—Practically.

Q.—Having got that small enclosed lagoon to begin pumping into that?

A.—When I came on the scene, the intention was also to carry on the work from Colaba at the same time.

Q.—Do you mean in August, 1920?

A.—Yes. As far as I remember, the whole of the specifications and conditions of contract for the Colaba wall were worked out by Sir George Buchanan before he left for South Africa. I think I am right in saying that. They may have been slightly elaborated afterwards in the office, but I think in the main they were done before he left for South Africa. When I got home, the idea was that we were to work departmentally from the northern end, and that the 8,000 feet was to be done by contract.

Q.—As regards reclamation, am I not right in putting it that the original intention was to build a certain section of the wall, then to carry from the end of it a crossbund down to the land, and thus enclose a small lagoon—what was referred to I think by Sir George Buchanan as No. 1?

A.—Well, the whole scheme was, when the sea-wall was built, to divide the area by crossbunds, and to pump in from the Harbour through the various conduits which were to be laid across the Peninsula.

Q.—Building the sea-wall in sections as was required and filling in the crossbunds, so that you had one lagoon into which you were pumping at one time, would have been an economical way of doing it, and then continuing your sea-wall whilst you were pumping in. The point I am trying to make is not to put an enormous amount of money in a sea-wall that is carried on far beyond the area that you are able at the time to reclaim?

A.—Yes, but I think that the whole work was to be done in a certain number of years. We knew approximately how much we could do per season. We have a season of only a certain number of days, and we knew approximately what we could do per season. As far as I remember, if the dredging had kept up, the wall would have had to have been in advance of the dredging to a certain extent—certainly a year's work.

Q.—You began the building of the wall in 1921?

A.—Yes.

Q.—July, 1921?

A.—No, it was in the cold weather.

Q.—Of 1921 or 1920?

A.—1921.

Sir Frederick Hopkinson.—About November?

A.—Somewhere about that—later probably, it was December. I have not got the exact date.

Chairman.—Is the present position that you have got an enormous length of sea-wall which is in two lengths, one coming from Colaba and the other from Marine Lines, of a total length of 4½ miles, minus 1850 feet in the middle—yes or no?

A.—Well, I have not been there for two-and-a-half years.

Q.—If you will accept it from me, the sea-wall now, with the exception of a gap of 1850 feet, is complete, Do you approve of the building of the sea-wall to that extent, or would it have been more economical to have built it keeping just ahead of the lagoons that you had made for immediate reclamation? It is obvious, is it not?

A.—Yes. Of course, the whole thing was upset by the dredger not turning out the quantity that was expected. As far as I remember, we were to finish that large block No. 8, I think it is.

Q.—The Military area?

A.—The Military area was to be finished either at the end of 1924-25 or the beginning of 1925-26—I forget now—at what point the wall stood, and what the distances were at that date I do not quite remember.

Sir Frederick Hopkinson.—But the whole thing was to be finished by 1926?

A.—Yes, according to Sir G. Buchanan's original report.

Chairman.—Why was it that the dredger which arrived in March, 1922, was not used for a year and nine months?

A.—Well, we had nothing to put it on to.

Q.—Why had you not?

A.—As far as I remember now, early in 1921 I went into that question very carefully and I wrote to Sir George Buchanan, or to Messrs. Meik and Buchanan, and said that

I did not see any possibility of the dredger starting work until the cold season of 1923-24. That was the opinion that I expressed.

Q.—That is the letter of the 20th May, 1921?

A.—Yes.

Q.—" I do not think the dredger will pump an ounce of material into the reclamation before the cold weather of 1923-24." That was a most accurate forecast. You were quite right about that. Sir George Buchanan on the 11th April, 1921, writing to you, had said: " The earliest the dredger can start work will be at the end of 1922 " —so that he is putting it a year earlier than you?

A.—Yes.

Q.—You were beginning at *this* end (*pointing on the plan*)?

A.—Yes, it was begun that end and the other, too.

Q.—Why was it not possible to enclose an area like that block 1, and pump into that within six months of the dredger arriving? Take it the other way, if you like. Take block 8, which is the Military area, or block 1, choose whichever you please. Why was it not possible to build the sea-wall to the extent necessary to shut in block 8 or block 1 and to run your crossbund down to the land? Why could not that have been done with regard to either block 8 or block 1?

A.—Well, it is two and a-half years since I had any connection with the work, and I am afraid I have not got the figures immediately at the back of my mind, to give you an answer. I should have to work it out and put myself back into the position of affairs then.

Q.—Can you give us at this moment any reason why it was not possible to enclose block 8 or block 1, whichever was most suitable, and to pump into it in the cold weather of 1922-23?

A.—May I look at the plan?

Q.—Please do?

A.—(*Pointing on plan Block* 8.) At the end of October, 1922, *that* was as far as the wall went.

Q.—So it went from zero to 2,000?

A.—Yes. There was this little crossbund here. No, that was put in afterwards, to work this length.

Q.—You got from zero to 2,000, in fact?

A.—Yes, that was in October, 1922. That was not worth while putting a dredger down on. It was only a very little area, and it would have been—I have not got all the figures now in my mind—a drop in the ocean.

Q.—We quite see that.

A.—With all this high ground, it would have been a very small amount. Sir George Buchanan always wanted us to get on and start. He wanted us to put the dredger on even for a month. Well, I was very much against that, because we should have to get all our crew out and all our staff for the dredger. They were men who were engaged here to work out there, and they were not men you could take on for a week and send away afterwards. It would have meant keeping them for six months or so. We should have had the expense of bringing the whole plant to site, getting all the pipes coupled up, and for a month or so's work I did not consider it was worth while taking all that trouble and expending all that money.

Sir Frederick Hopkinson.—It was not a business proposition?

A.—No.

Chairman.—I am suggesting to you that if you had chosen either block 8 or block 1, and had concentrated all your efforts on block 8 or block 1, could you not have begun pumping in 1922-23?

A.—No, I do not think so. I do not think we could deposit more material at one working face. We had to go out a long way, and had only one point of access to each working face. It was not as if we were working out from the shore.

Sir Frederick Hopkinson.—Your question is based on the assumption that they knew that the dredger was going to get there in March, 1922, and whether they could not have been ready when it got there?

A.—No, we could not have been.

Q.—That is to say, the dredger was ordered too early?

A.—The dredger was ordered too early. It came out there too early. As I say, I wrote in 1921 that I did not think she would work before the cold weather of 1923-24, and she began on the 8th December, 1923

Chairman.—58½ lakhs would be £440,000. The position at the present moment is that the cost of that sea-wall up to the 30th June, 1926, is £440,000. Keeping that

figure in your mind, would it not have been more economical to have begun the wall at one end and not to have begun it at both ends?

A.—Well, that was done under orders.

Q.—I agree; but I am merely asking you on the question whether it would not have been better engineering and more economical to have begun from one end rather than from both ends. Look at the interest on the £440,000, it is £27,000 a year interest.

A.—But, of course, we were always told: "This dredger is going to do 2,000 cubic yards an hour. It is going to do 5,000,000 cubic yards in a season." We had to get on ahead of that.

Q.—And you did, did you not?

A.—Yes.

Q.—Still, I would like an answer to my question, which is: Would not it have been more economical, and would not it have been the proper way, to build the wall from one end and not from both ends? Never mind who gave the orders.

A.—(*After a long pause.*) Well, it would appear so now.

Q.—Supposing you had had a perfectly free hand, supposing there had been nobody to control you, would you have built the sea-wall from one end only and not from both ends?

A.—I was not in that position.

Q.—I am asking you now?

A.—I should probably have done a great many things in a different way.

Q.—Will you confine yourself for the moment to the question of the sea-wall? Had you been in sole charge of this work, having complete control of it, would you not have built the sea-wall from one end and not from both ends?

A.—I never considered that.

Q.—Will you consider it now, please? The answer is, surely, yes, is it not?

A.—Well?

Q.—Is it not so?

A.—Probably, if I were to take up the work absolutely from the beginning, if it had been absolutely free, it is quite possible that I should have done things a great deal differently.

Q.—Never mind about doing things differently. I want you to keep to the sea-wall. Is it not quite certain that you would have endeavoured to have put as little unproductive money into the sea-wall as you could; that is, you would not have built a sea-wall to lie out there with a large extent of the sea-wall having no enclosed areas?

A.—Probably I should not.

Q.—That is to say, you would have built the sea-wall from one end and enclosed the lagoons successively as one after the other was about to be reclaimed, would you not?

A.—Yes, I should have kept on ahead.

Q.—I quite agree that you would have kept on ahead, but not so far ahead as to have a useless length of the sea-wall?

A.—May I go and look at the plan again?

Q.—Please do. Let us take block 8. You built along the end *here*?

A.—That is, 5,500.

Q.—You build up there, and then you run the crossbund and in that way you get your enclosed area?

A.—Yes.

Q.—Then, when you are pumping into that enclosed area, is not the business thing to do to go on extending your sea-wall up to block 7?

A.—Yes.

Q.—Extending it up to *there* (*pointing on the plan*)?

A.—Yes.

Q.—And when you have got it up to there, enclosing your lagoon by either a storm-water drain or a crossbund?

A.—Yes, that was the idea.

Q.—But, surely, the moment you start with a wall at both ends you are going to let yourself in for a very heavy cost, are you not?

A.—You must remember we had the "Kalu" there.

Q.—It is true you had the "Kalu" there. What was the "Kalu" supposed to do?

A.—The "Kalu" was supposed to dredge.

Q.—Where?

A.—When we first got her it was not settled.

Q.—Was it not? Did not Sir George Buchanan put forward the theory that the "Kalu" should work in connection with the "Colaba" and the "Sir George Lloyd"?

A.—That was put forward at one time; but that was only for the occasions where very long lengths of pipe had to be used.

Q.—Originally the "Kalu" was bought for the East Colaba reclamation?

A.—I do not know what the "Kalu" was bought for. I do not remember the date when it was bought.

Sir Frederick Hopkinson.—It was before your connection with the matter?

A.—It was before my connection with it.

Chairman.—The "Kalu" was bought in 1919?

A.—I had never heard of the work then.

Q.—On the 24th September, 1919, Sir George Buchanan recommended the purchase of the "Kalu"?

A.—Did he recommend the purchase of the "Kalu"?

Q.—He did in fact recommend the purchase of the "Kalu" on the 24th September, 1919, and in November the Government decided to buy the "Kalu" for £75,000. She was bought for £75,000, and then some £25,000 worth of repairs were found to be necessary?

A.—Yes.

Q.—And she started work some five years later. That is the history of the "Kalu" up to that point. Anyhow, the "Kalu" was bought. The original plan was to work the "Sir George Lloyd" alone pumping from the harbour, with the "Colaba" as the intermediate pumping station. That is right, is it not?

A.—Yes.

Q.—Then it was suggested by Sir George Buchanan that the "Kalu" might work with the "Colaba" and the "Sir George Lloyd" when extra long lengths of pipe were required, but she never in fact did that.

A.—No.

Q.—Do you know her history? Do you know what she did up to the time you left?

A.—She had not started work when I left.

Q.—She had not started work at all?

A.—No, I do not think so. I am right in that, am I not?

Mr. Elgee.—Yes.

Chairman.—You left in July, 1924?

A.—Yes.

Q.—The "Kalu" had not started work then at all. Was the great essential of this work the certainty that there was material of a quality and character suitable for reclamation?

A.—Yes, that was the crucial point.

Q.—Did you know very much about the character and quality of the material in the harbour?

A.—I did not know very much.

Q.—In fact, one may say you really knew nothing at all about the character of the material in the harbour down to December, 1923?

A.—We knew a little before.

Q.—I am asking you.

A.—We knew before that.

Q.—What did you know?

A.—My attention, I think, was drawn to the quality of the material—it must have been some time before July, 1921. Mr. Mitchell was a chemist and geologist, and as far as I remember we got talking about the work—I do not know where—and I think it must have been from him that I rather had my doubts about the quality. It was that and inspection of the cross-sections over the area that was to be dredged. I was not happy about it.

Q.—It was nothing to do with you?

A.—It was nothing to do with me.

Q.—It was rather late in the day for the Chief Engineer, when £850,000 worth of dredging plant had been purchased, to be unhappy about the character of the material, was it not?

A.—Well, I had to take things as I found them.

Q.—Exactly.

A.—I then cast round to see whether there was any other source possible, and that was why I started doing the borings in Back Bay.

Q.—I will put two letters to you, and then I will repeat the question. On the 28th July, 1921, you wrote this letter to Messrs. Meik and Buchanan : " I have noted your remarks and do not propose to go further into the subject "—that is the material to be dredged from the harbour—" until we find by experience what is the character of the material we have to deal with." Ought not the character of the material to be dealt with to have been ascertained before any order for a dredger was placed?

A.—I quite agree.

Q.—That shows that in July, 1921, you did not know what the character of the material was that you would have to deal with?.

A.—I was not sure about it.

Q.—Let us see what happens. After that letter there is an interval of some 16 months. Then on the 21st November, 1923, you say : " I would point out that we are by no means sure that the filling from the harbour is going to be of use as a means of reclaiming the area." That again pointed to your lack of knowledge of the suitability of the material?

A.—Well, we had then pumped and the material that we got was so good we thought our fears were all allayed.

Q.—On the 10th December, 1923, you see you are writing—this is two days after the dredging had commenced—" I consider that if material suitable for filling is met with in the harbour there is no reason to doubt the capacity of the dredger to do its guaranteed output." Does not that show that right away down to the 10th December, 1923, you, the Chief Engineer of the project, through no fault of your own, were in ignorance of the character of the material with which this dredger would have to deal?

A.—I was in doubt until we had actually dredged.

(Adjourned for a short time.)

Chairman.—The first letter to which I referred you was the letter of the 28th July, 1921, in which you said, " Until we find by experience what is the character of the material we have to deal with." The character of the material could have been found by experience during the season of October, 1921-22, could it not, with a grab dredger?

A.—I did try a grab dredger.

Q.—In the harbour?

A.—In the harbour. The results were not very convincing to me. We had a grab, and it went down into mud, and the mud was so thick that the grab did not work properly.

Sir Frederick Hopkinson.—What you mean is that you did not get down to the clay?

A.—We could not get down to the clay. There is more mud, I think, than clay shown in the section, so far as I remember, and we did not get down to the clay with the grab dredger.

Chairman.—Was the decision to prospect in Back Bay in consequence of the fact that the Port Trust and the Royal Indian Marine took away a certain dredging area?

A.—I cannot quite remember as to dates.

Q.—What took you into Back Bay at all, because Back Bay dredging was no part of the original scheme? All was to be done from the harbour?

A.—Yes. As I say, I had a certain amount of doubt, and I wanted to see if we could get a second string to our bow. I think it was in 1921-22 that I tried to do some wash borings in Back Bay. They were not as successful as I thought they ought to be. They did not get through the stuff very well. Then in 1922-23 I put on a Calex drill and we took borings—I forget now how many, but a good many. The cores or samples of the cores, anyway, were all got ready in 1923—about the end of the fine weather.

Q.—Did you not come to a definite conclusion that there was very little possibility of getting sufficient material from Back Bay?

A.—No.

Q.—For instance, there was not sufficient material to work the " Sir George Lloyd " dredger economically there, was there?

A.—As far as I remember, there was an average depth of about 18 feet.

Q.—Surely not. Look at your letter of the 10th May?

A.—That was after the unsuccessful first season's work. There is another letter which gives the result of the second season's borings. The letter of the 10th May, 1922, gives an average of 9 feet, about. There is a record of another season's work in which we did the borings again.

Q.—Did you ultimately show there were 24 million cubic yards to be obtained there?

A.—I forget the figure.

Q.—Was it a very large amount?

A.—It seemed that there was a possibility of there being enough, very considerably to help matters.

Q.—How was a dredger like the " Kalu " going in to do the work in that shallow Back Bay?

A.—The idea was that she should have her moorings, come in on the tide, and dig a hole in which she could float.

Q.—Dig her own flotation?

A.—Yes.

Q.—Do you know how long she took to do that, in fact?

A.—No.

Q.—She took a whole season to dig her own flotation. She was there for two or three hours every day for alternate weeks, spring tides, and at the end of the whole of the season she had just dredged a sufficient hole to enable her to float.

A.—I think the suggestion of bringing the dredger in to dredge a hole for herself emanated from Meik & Buchanan's offices.

Q.—Obviously, if her draught was such that at low water she would be on the rock, or on the bottom, she has either got to dredge a hole for herself or she has got to have some grab dredger to do it for her. You cannot leave her there as the tide is receding?

A.—No.

Q.—Therefore, if you are taking the " Kalu " into Back Bay at all, she has either to go in and out for a few hours each day for every other week, or she has got to dredge her own flotation, or have it dredged for her?

A.—The proposal which I put up, as far as I remember, was that she should dredge her way in.

Sir Frederick Hopkinson.—From deep water?

A.—Yes.

Q.—Making a long narrow channel?

A.—Yes. That was put forward to Messrs. Meik & Buchanan, and they settled it was to be done on tide work; but what was actually done I do not know.

Q.—Did not they send you the plan showing this long narrow channel?

A.—No. We sent it home to them.

Q.—Are you sure?

A.—As far as I remember.

Q.—I think the plan emanated from London?

A.—No. A scheme was worked out between Brims and myself. I think so.

Q.—It may have been worked out by you and sent to London and returned from London?

A.—It was returned from London, and they said that what should be done was to go in and work on the tides. I think in the letter which came, as far as I remember, there was some reference made as to proposals to dredge the channel and bell mouth made by me.

Q.—Is not this the plan? (*showing plan* 3411 *to witness*).

A.—No.

Q.—That shows what you are describing?

A.—That was not the one

Q.—It has your number 603 on it. This is your plan. This has Meik & Buchanan's stamp on of the 2nd May, 1923, and your stamp on of the 11th June, 1923, so it looks as if this plan was sent from London to you, and you put your stamp and number on it. It shows this long narrow channel from deep water into the place where the dredger was going to work. Here is another one, with your number 913, 4-6-24?

A.—That was just before I left.

Q.—That shows the same: " Flotation cut for dredger. Material to be cast on one side."

A.—Yes, that was it. That was the idea.

Q.—Whose idea was that—your's or London?

A.—I think that originated in Bombay. It was the result of talking things over with Brims.

Q.—It will be yours then, coming from your office of which you were the head?

A.—I think so. The other scheme, as far as I remember, of coming in and doing it on tide, did originate in London. I could not be quite sure, but that is the feeling I have about it.

Chairman.—At the time when you became chief engineer, did you believe that five million cubic yards of dredging was capable of being done in the 170 working days?

A.—At that time really the whole idea of the dredging had been so settled on, and we were very hard pressed on other matters, that it was only later that we began to go into the question. I think I rather took Sir George Buchanan's figures, and I did not dispute them.

Q.—Did you think it could be done?

A.—I think it would have been very difficult. Of course, it would depend on what the dredger's output was. We were told that the dredger would be able to do 2,000 cubic yards an hour. I had had some of Messrs. Simons' dredgers working before under me. and my experience of them was such that I should not have been at all surprised if we had had more than the 2,000 output

Q.—To what dredgers are you referring?

A.—I am referring particularly to a dredger called the " Oswald."

Q.—Was she a rotary cutter suction dredger?

A.—Yes, she was a cutter suction dredger and was built for the Government of Burma by Messrs. Simons. She was engaged on the cutting of the Twante Canal in Burma, which is a canal 23 miles long with a 200 to 300 feet bed width—quite a considerable thing. There were three dredgers got for that work—the " Oswald," the " Campbell " and the " Lees." The " Oswald " was working in Mesopotamia, and the " Campbell " and the " Lees " came up afterwards to Mespot. As a matter of fact, I worked the " Oswald " 24 hours on end, three shifts, for two solid months in the Hamar lake. She was dredging a very heavy and hard clay—grey clay. We were working under very difficult circumstances, and we took very careful records of those two months' work, and only on two days in those two months did the " Oswald " turn out less than her guaranteed output. She has already done five years' work in Burma to my knowledge. I must tell you that Hamar lake was really an overflow of the Euphrates. The Euphrates had burst its bank and had made an immense lake. After the floods the water got very shallow. It was not more than about 15 inches deep. With the hot sun on it the water got very hot indeed. The water was over 100° temperature. On those two days the water was so hot that we practically could not keep steam. I was looking at the records the other day, and I found that day after day the dredger turned out considerably more than its original guaranteed output. So that personally I had it at the back of my mind that probably the " Sir George Lloyd " would be able to turn out a greater quantity than the 2,000—the amount specified.

Q.—Had you seen the publication of Mr. Messent, the chief engineer of the Port Trust, of the performances of the " Kalu " and " Jinga " ?

A.—No.

Q.—That was accessible to you. It was published in 1915 in Bombay, and was a narrative of the work done by the " Kalu " and " Jinga," both suction dredgers, and both built by Messrs. Simons. I need not take you through the figures, but if you had seen them they might have caused you to alter your view. They were working on the Sewri reclamation. When did you begin to have misgivings about the output of the dredger?

A.—Only just before I left.

Q.—You left on the 12th July, 1924?

A.—Yes.

Q.—I want it a little closer than that. Did you have misgivings in January—six months before you left?

A.—I do not remember.

Q.—Or February?

A.—I could not say month by month.

Q.—How long before you left in July, 1924, did you begin to have misgivings?

A.—I do not know when. I could not give a date like that.

Q.—Had you any misgivings, or did you go away in the belief that everything was well?

A.—No. We had the final figures.

Q.—By final figures you mean the amount said to be deposited in the reclamation?

A.—Yes.

Q.—You could have had misgivings on the 15th December, 1923, could you not—that is, seven days after the dredger began to work?

A.—You mean on the results?

Q.—I mean on the results of the soundings. The dredger began to work on 8th December, 1923, and she was supposed to dredge 2,000 cubic yards an hour. You had the number of pumping hours; your people took soundings every succeeding day,

and in seven days you ought to have known from the soundings that that dredger was not giving anything like her output of 2,000 cubic yards an hour?

A.—Yes, I probably did.

Q.—If you did know it in December, 1923, did you bring it at once to the attention of the Directorate of Development?

A.—I really cannot say.

Q.—See how important it was. The whole thing hinged, did it not—the whole financial success of the scheme, and everything—on a dredger working with perfection 2,000 cubic yards per hour for 15 pumping hours for 170 days in the year? If she was only turning out 50 per cent. of her guaranteed output, that would mean that the reclamation would take twice as long, would it not?

A.—Yes.

Q.—And might be disastrous from a financial point of view?

A.—Yes.

Q.—Now cannot you remember whether, in fact, you looked at the soundings when they came in?

A.—Well, of course, the ship was a new ship. The dredger was a new dredger. We had a new crew on board. One would not perhaps expect to get the full outturn immediately.

Q.—That is a very fair answer. What I want to know is did you, in fact, know within a week of the time of the " Sir George Lloyd " commencing that the soundings showed that she was not giving 50 per cent. of her guaranteed output?

A.—Well, if the report said so—I mean if that is the result of the report, I must have known it.

Q.—Mr. Spiers was the dredging master, was he not?

A.—Yes.

Q.—He was nominated by Messrs. Simons & Co.?

A.—Yes.

Q.—Or nominated by Meik and Buchanan?

A.—Meik and Buchanan simply went to Messrs. Simons and asked them to give the best dredging master they could.

Q.—That is right, and up to now no complaint has been made as to the personal efficiency of Mr. Spiers?

A.—Certainly there was none in my time.

Q.—Very well. Then you have got on 8th December a suction dredger which was one of the most powerful in the world; you had a very experienced dredging master. How long should it take the crew to settle down to get the proper output of the vessel—a month or six weeks?

A.—I think it certainly ought to be done by then. Yes, I think it ought to be done by then.

Q.—Six weeks brings us nearly to the 1st February. Take the 1st February. From the 1st February to the end of that month, were you always aware that the dredger was not giving more than 50 per cent. of her guaranteed output?

A.—Well, as I say, I cannot remember the figures, but if the reports that came in showed that, I was aware of it.

Q.—If you were aware of it why does one find in this correspondence between yourself and Messrs. Meik and Buchanan no reference to it?

A.—They had the same information.

Q.—Doing only 50 per cent. of her guaranteed output was a matter of vital importance, was it not?

A.—Yes.

Q.—And it was obviously a thing that you should have communicated at once to Sir Lawless Hepper. It was a breakdown of the central machine, was it not?

A.—Yes.

Q.—Ought you not to have communicated that at once to Sir Lawless Hepper and have said, " Look here, here is the whole scheme going to come to grief because the dredger will only give 50 per cent. of her output." Did you ever do that?

A.—I do not know that I did it in writing, but I think I certainly talked it over with Sir Lawless Hepper.

Q.—Did you ever have any interview with Sir George Buchanan about the low output of the dredger?

A.—Yes, I think we did, as far as I remember.

Q.—Can you fix a date at all—what month?

A.—It was when Mr. McMurray was in Bombay that year. I remember we had several talks about it. Mr. McMurray was there and he went over the work

with us. Sir George Buchanan, Mr. McMurray, Mr. Brims and myself all went over the dredger and right along the pipe line. I remember that.

Q.—What were you discussing at that time?

A.—We were discussing as to how we could improve the output.

Q.—Had you told Sir George Buchanan that the output was in the neighbourhood of 50 per cent?

A.—I think I must have done so. I cannot remember specifically having told him such-and-such is the case.

Q.—Did he offer any explanation?

A.—No. There was no explanation that I could feel was satisfactory.

Q.—Did Mr. McMurray offer any explanation?

A.—I think Mr. McMurray's attitude was that we were not working the dredger properly.

Q.—In what way were you not working it properly? Did he tell you?

A.—He must have told us at the time, but I really cannot remember the details. It was mainly, I think, the way the pipes were laid out, and things like that.

Q.—Can you remember at all what Mr. McMurray advised?

A.—I do not think we got any satisfactory advice. We were sort of told, " Go and do better "—something to that effect. I do not remember, and I would not like to say actually to a certainty. I do not remember that we got anything really helpful.

Q.—Can you remember whether Mr. McMurray said to you, or to anybody in your hearing, " Oh, we designed a dredger to cut soft clay, and you are putting it to work in hard clay? " Did he ever say that, drawing the distinction between soft and hard clay?

A.—I do not remember it.

Q.—It would be a very striking thing to say, would it not?

A.—I do not remember hearing anything of that kind until a letter which I got long after I left Bombay. I think that was the first time I heard that that was the attitude which Messrs. Simons took up.

Q.—I still feel puzzled about this. You must forgive my going back to it. You were the chief engineer. The soundings, that is, a daily record of the amount excavated by the " Sir George Lloyd," came into your office, and you were able to see each day the work that was said to have been done on the preceding day. I feel in a difficulty as to why you did not, within a week of the dredger beginning to dredge, raise a great disturbance about this matter. Seven days' figures would have shown you at once that for some reason she was doing less than half her guaranteed output. Why did you not make a disturbance about it? You have told us she was a new craft with a new crew and that that may have been the reason?

A.—I think it was partly that. That certainly had an influence.

Q.—You were influenced by the fact of a new craft and a new crew. You told me that in six weeks the people ought to shake down, and therefore I ask you why you did not, in February or March or April or May, make a great disturbance about this matter?

A.—Well, I do not know.

Q.—Is it right to say that when you were considering the work which would have to be done, the storm water drains were overlooked? Let us take Sir George Buchanan's original estimate. In Sir George Buchanan's original estimate is it not the fact that the storm water drains are omitted?

A.—It is so long since I have seen this thing.

Q.—Take my copy and turn to page 29. You see there is an omnibus item there. Let me read you what somebody has said. This is on the sea wall: " (Q.) no provision had been made for the storm water drains, so that although you got the dredger there, and although you got the wall built, you could not begin dredging because the storm water drains had not been built? Why not have built the storm water drains first of all? (A.) It had been overlooked.—(Q.) It is an expensive overlooking. That accounts for the tying up of the dredger for 18 months, does it not? (A.) I think it is one reason why the dredger could not have started in October, 1922, or December, 1922.—(Q.) Did Sir George Buchanan overlook it? (A.) I think he did.—(Q.) How long is the storm water drain "—and then he gives the length. " (Q.) Do you mean that all the storm water drains had been overlooked? (A.) I think the necessity for storm water drains, or rather of constructing them before the filling in was done, was overlooked. There is a letter in the correspondence with Meik and Buchanan referring to this." With that document in front of you at Page 29, are you able to say whether in fact in London in August, 1920, when you were making out the plant and material required, that the storm water drains were in fact overlooked?

A.—I do not know that they were gone into. In fact, I am sure they were not gone into in London at that time. It was when I got back to Bombay that I went into the matter.

Q.—That is exactly it. You in London, dealing with the necessary plant and the amount of material that would be required for the execution of these works, made no provision for storm water drains?

A.—Well, you see there were then no plans for the storm water drains from which the plant required could be determined.

Q.—I am not criticising you. I want the fact?

A.—Storm water drains really—well, they had not then been considered in detail.

Q.—They had not crossed your mind?

A.—They had crossed my mind. I knew drains would be necessary, but I was being urged to get things started. I certainly admit it was one of the items, but we had to get on with the quarry; we had to be able to get our material, and the storm water drains were taken up at a later date.

Q.—At a later date, undoubtedly, but you are not going to suggest that storm water drains are in that item on Page 29, are you?

A.—Well, that is not mine. That is Sir George Buchanan's. In the sanctioned estimate the question had been gone into. That was in 1922.

Q.—The sanctioned estimate of 702 lakhs did include provision for storm water drains, and I am right in saying that the cost of those nine storm water drains was £482,000.

A.—I do not remember the figures.

Mr. Billimoria.—In the revised estimate 60 lakhs have been added over the 75 lakhs.

Chairman.—That is how you get it. There were 62 lakhs in fact.

Witness.—The figures in the 1922 estimate were done quite irrespective of *this (pointing to page 29, Buchanan's report)*. This was a half-sheet of paper, and the other thing was a compilation of a very great number of estimates for particular works, etc.

Q.—Did you also study Mr. Kidd's report? You must have done so because Sir Sir George Buchanan proceeded to some extent on Mr. Kidd's report?

A.—Yes, he did.

Q.—The 1912 one?

A.—I do not know that I had a copy of that in our office.

Q.—I was not so much asking about that, but that answer very much surprises me. The point of my question really is that when in August, 1920, you went into Sir George Buchanan's office, would you not naturally have had your attention called to Mr. Kidd's report, because, you see, Sir George Buchanan makes so many references to Mr. Kidd's report in his that it was an essential document for you to see?

A.—Yes, I did read it. I remember now.

Q.—He estimated that he could do the reclamation in 1912 for 325 lakhs. Did that occur to you as a reasonable figure?

A.—It was impossible. Things had changed so much between 1912 and 1920 in every sort of way.

Q.—Still, you were living in 1912 and you were an engineer in 1912. Did it occur to you that Mr. Kidd's figure of 325 lakhs for a 1912 project was about right?

A.—I do not think I ever went into it.

Q.—When did you begin to have misgivings about Sir George Buchanan's figure of 367 lakhs? Was it when you were actually in his office in August, 1920?

A.—No, I had too little to go on there. It was when I got back to Bombay and we got working out the estimates and things, and it must have been in 1921 that I saw it was not sufficient. I think Sir George Buchanan saw that too. He made up another estimate in February, 1922.

Q.—And you proceeded to make a detailed estimate which eventually worked out at 702 lakhs?

A.—Yes.

Sir Frederick Hopkinson.—That 702 lakhs is not the real figure, because in the estimate of 1919 Sir George Buchanan gives credit for 10 lakhs for plant, whereas in this estimate they give credit, I think, for 67 lakhs. Therefore, the comparable estimate would be about 760.

Chairman.—Let us get that right. In Sir George Buchanan's estimate he gives credit for 10 lakhs as the ultimate sale price of the plant, does he not?

A.—Yes.

Chairman.—Therefore, the net cost was going to be 357 lakhs. Your estimate of 702 gave 67 as the amount that would be recoverable on the sale of the plant.

Sir Frederick Hopkinson.—Yes, 67 and nearly six lakhs more for the value of the plant that they were going to debit to East Colaba. So it really is 73, making 774.

Chairman.—It is 377 as compared with 774. We are going to take formal evidence as to the rise in price of material between 1912 and 1919 and onwards, but will you tell me this. Was there such a rise in the price of material between September, 1919, and your revised estimate in 1921 as would account for the difference in your price and Sir George Buchanan's?

A.—No, I do not think so.

Q.—That is, you found in preparing the 702 lakhs estimate that you had to provide higher prices than Sir George Buchanan had put for corresponding work?

A.—Yes, I had to amplify.

Q.—Amplify Page 29?

A.—I did it on different lines.

Sir Frederick Hopkinson.—Sir George Buchanan's estimate, I think, is 13 items. Yours is probably 700. Is that right?

A.—Yes, and of course each of the items here is the bare result of a long estimate, often. In fact, the detailed estimates were only available in 1922.

Q.—But you never saw such details connected with the 1919 estimate, did you, in London?

A.—No.

Chairman.—You told us you saw no details whereby the sum of 367.61 was arrived at?

A.—No, I do not remember ever having seen it.

Q.—How about the sea wall? One object of the sea wall and one object of the cross wall—what we have called the Bund—was to retain the material pumped into it?

A.—Yes.

Q.—As regards the sea wall, was there in your time any leakage of reclaimed material?

A.—Oh, yes—very fine stuff. Fine stuff was going through.

Q.—That, of course, in itself brought down the figures of the amount ultimately deposited?

A.—Yes.

Q.—Did you regard that leakage as serious?

A.—Yes.

Q.—In the year that you were there, 1923-24, 859,858 cubic yards were said to be dredged as ascertained by soundings, and the amount of filling as measured in Back Bay was only 528,000?

A.—That loss may have occurred to a certain extent in the harbour. The tide may have taken a certain amount off when the cutter was working. The tide may have taken a certain amount of it away. I do not think the figure of 800,000, or a relative figure, ever went through the pipe.

Q.—But the sea wall ought to have retained the material, ought it not?

A.—Yes.

Q.—It ought to have been so constructed as not to be porous?

A.—Yes, naturally.

Q.—Was the sea wall constructed in accordance with a design approved by Sir George Buchanan?

A.—Yes. There was very little altered in the main design of the wall; that is there was the rubble mound and on top of that the mass concrete wall. In principle that was adhered to all the way through, except for the 2,000 feet at Colaba.

Q.—Did he ever make any complaints to you that there was mishandling of the dredger?

A.—I do not remember any.

Q.—Did he ever make any complaint to you that the work as a whole was being carried on inefficiently?

A.—No, not as a whole. Now and again he would bring up items. He would say that he did not like this, or thought that we might do better there; but on the whole I think we did the work satisfactorily.

Q.—I was referring to a statement which has been made by Sir George Buchanan that for years he had been complaining against inefficiency and extravagance?

A.—You can see his reports. On one occasion I remember he found a heap of ballast was not quite clean. It happened to have come in a little dirty Then there was some question of sand which did not quite please him, but I do not think as a rule there was any complaint.

Q.—Can you remember any instance in which he took you aside as chief engineer and told you in terms that the work was being carried on—the whole work—with inefficiency?

A.—In so many words?

Q.—Not in so many words. Did he ever take you, as chief engineer, to task and say "Look here, this work is going wrong because you are all inefficient"?

A.—No.

Q.—Did he make any complaint of inefficiency to you as chief engineer against any particular man that you remember?

A.—No, I do not remember any.

Q.—We know there was an order given for a variety of fresh plant?

A.—In 1922, or it may have been 1921. We ordered a lot of wagons.

Q.—On the 17th March, 1922, you enclose a list of additional plant required for the Back Bay reclamation scheme?

A.—Yes.

Q.—The firm of Messrs. Meik & Buchanan took some exception to some of the plant that was asked for, did they not?

A.—Yes. I remember one item of railway wagons.

Q.—Did they say this: "We shall be glad if you will discuss this letter with the Director and send us a cablegram at the earliest possible date. We fully understand that as the work is being done without a contractor great weight must be attached to the wishes of the engineer on the spot in the matter of plant and plans for execution. We have no desire in any way to hamper you. On the other hand, it must be remembered that in addition to the actual capital cost of the plant, interest for many years has to be paid, and it is desirable to economise wherever it is possible to do so without interfering with efficiency or with speedy execution"?

A.—Was that with reference to the wagons?

Q.—That was in reference to 132 20-ton side tipping wagons, two locomotives a 6-ton crane and three Ruston navvies?

A.—That demand was consequent on the order to do the work at Colaba.

Q.—To get 2,000 tons a day?

A.—Yes, instead of the 1,000 as originally intended.

Q.—Then in point of fact it appears that you did consult Sir Lawless Hepper, and on the 3rd May, 1922, a telegram is sent confirming the fact that the material was required?

A.—Yes. I think there were some alterations made, were there not? For instance, that item of the crane was left over.

Q.—Yes. A telegram was sent saying that with some exceptions the other material was required. The letter I have read you from Messrs. Meik & Buchanan was a case in which they were counselling you not to specify for more things than were absolutely necessary?

A.—Yes, but the task we were set had been doubled.

Q.—I follow that. Except for that letter, and possibly one other, have you any recollection of there being any suggestion of extravagance?

A.—On one occasion Sir George Buchanan accused us of having put in 50 per cent. more stone into the Marine Lines section than was necessary. That would be in 1922-23 I think, but I pointed out to Sir George Buchanan that the cross-sections which he had got from an assistant-engineer on the work contained two items of the estimate—that is, it contained the rubble mound and the protection stone, which were two items in the estimate. He lumped the whole thing together, took the figure on the rubble stone, and said "You have exceeded it by 50 per cent." I pointed this out in several letters to him but I got no redress. That was one item I remember.

Q.—In fact was there any excessive amount of stone in the building of that wall?

A.—There was a slight excess, and that was due to the fact that when we opened out the quarry there was more small stuff than we got later on.

Q.—Relatively, to a work that was costing hundreds of thousands of pounds, is not that a very small matter?

A.—Yes; it was a matter which I do not think one need bother about.

Q.—Can you recollect any other instances at all in which there was any suggestion that there was extravagance?

A.—In 1921, I think, you will see in one of Sir George Buchanan's reports he said he thought we had done the work at Kandivli rather too well. Really, as a matter of fact, we had to handle a great deal of traffic and do a great deal of work up there, and if we had not had good arrangements it would have been impossible to do the work.

Q.—In your opinion, was there any extravagance at Kandivli?
A.—No; every penny was most carefully looked after.

Q.—I want to go back to the dredger and then I have finished. Throughout the whole of the time you were there, how many hours a day did the dredger work from the 8th December to the monsoon?
A.—I cannot remember now. It will be in the reports.

Q.—Whilst you were there, there never was a double shift, I believe?
A.—No; I do not think there was.

Chairman.—That is right, is it not, Mr. Elgee?

Mr. Elgee.—Yes; a single shift.

Sir Frederick Hopkinson.—We have had that over and over again.

Chairman.—There is no question about it being a single shift. Did not that fact alone make it absolutely impossible to get 5,000,000 cubic yards in 170 days' working?
A.—Yes; it would.

Q.—It was absolutely impossible?
A.—That was working on the basis of 15 hours of pumping.

Q.—15 actual pumping hours?
A.—Yes.

Q.—Did you at any time make any report in writing to the Director of Development with regard to the certainty that the pumping season of 1923-24 must be a failure because you were only working one shift, and because the soundings showed that she was only pumping 50 per cent. of her guaranteed output?
A.—I cannot remember for the moment any report; but I was in constant communication with Sir Lawless Hepper.

Q.—We have had Sir Lawless Hepper in the box. Did you ever before you left India put those two points before him, that the dredging season of 1923-24 was bound to be a failure because the vessel was only working single shift; and secondly, because the soundings, which were sent into your office each day, showed that she was doing only 50 per cent. of her guaranteed output? Did you ever put those two facts plainly and directly to Sir Lawless Hepper?
A.—I wrote a note to him shortly before I left, in which all the figures that I had were included.

Q.—Did you in that note, or in any note, put it to him in the way that I have put it to you, that because of the single shift and because the soundings showed that the vessel was giving only 50 per cent. of her guaranteed output the result for the season 1923-24 must be a failure?
A.—I gave him the actual facts.

Q.—Did you fasten on those two cardinal points—single shift and 50 per cent. of output?
A.—I cannot remember the actual wording of the note.

Q.—Where would the note be?
A.—It will not be in there with those documents. That is only the correspondence of Messrs. Meik and Buchanan.

Q.—Was that an official note written to him just before you left India?
A.—Yes; shortly before I left India.

Q.—July, 1924?
A.—I think it was in June.

Q.— June, 1924?
A.—Yes.

Q.—Written by you as Chief Engineer to him as Director of Development?
A.—Yes. It was an unofficial note, as we call them. Most of the correspondence was done in that way. We were in the same building.

Q.—As a result of that note, did you have any meeting with him to discuss it?
A.—Well, I was always going down to his room and discussing things with him, and we certainly did discuss that.

Q.—What I want to get at is: Did you ever tell Sir Lawless Hepper plain and straight, " This dredging season must be a failure because of the two reasons, single shift and output 50 per cent. less than the guaranteed output "?
A.—As far as I remember, in that note I pointed out to him what had happened and what the results were. I am pretty nearly certain that I drew his attention to the result that that working would have on the work. I drew his attention to the effect that those results would have on the work—I am speaking to the best of my recollection.

Q.—In other words, that the season 1923-24 must be a failure?
A.—That it certainly had not come up to anticipation.

Q.—And had not come up to anticipation, because instead of having 5,000,000 cubic yards you only had 528,000—about one-tenth?

A.—Yes.

Q.—If you sent a note of that description to Sir Lawless Hepper, must he not have called you in and discussed the matter with you?

A.—I think we did discuss it—yes; we did discuss it.

Q.—Do you retain any real recollection about it? Have you not any real recollection about it?

A.—I recollect being down in his room with him and talking the matter over with him.

Q.—You see you were the Chief Engineer. Sir Lawless Hepper had definitely disassociated himself from any technical knowledge. He said: "I had no technical knowledge. Mr. Lewis was Chief Engineer." As Chief Engineer, I am suggesting to you that on 22nd December, 1923, and so on, day by day, week by week, throughout the dredging season you were in a position to know that this dredging was going badly. I ask you why you did not make the most definite, if you like, alarming statements to Sir Lawless Hepper about the certainty of failure unless matters were remedied. Why did not you do it? Can you tell me? What is your answer?

A.—(*After a pause.*) Well, I think that we realised that we had not then done what was anticipated and we rather hoped that things would improve. I think that was the main thing. What I had always been troubled with was the quality of the material. That was my first fear. When we started pumping we got excellent material but we got a smaller quantity of it.

Q.—No matter what the excellence of the quality was, the smallness of the quantity was going to throw your time schedule out completely?

A.—Yes.

Q.—I cannot carry that any further, but still I am puzzled, and if you can help us I should be glad as to why it was that you did not, as I say, week after week, write to Sir Lawless Hepper memoranda about this thing saying: "It is going wrong and it must go wrong and will continue to go wrong, and something must be done." Why did not you send imperative memoranda to him so that he would know exactly your view as Chief Engineer? You cannot give me any other answer?

A.—Well, I think a great deal of our communication was done really by word of mouth. I used to go and see him and talk over things. In that way a great deal did not get on paper, but I think Sir Lawless Hepper certainly was kept informed of the progress of the work.

Sir M. Visvesvaraya.—Is it because you lost confidence in the dredgers that you did not take any decisive action or was it because you were leaving the works?

A.—No, I do not think the fact that I was leaving the work made any difference.

Q.—You said in a note on the 21st November, 1923: "I would point out that we are by no means sure that filling from the harbour is going to be of use as a means of reclaiming the area"?

A.—That was before we began. The result of the filling was a great surprise to me, and a very pleasant surprise to me, as regards the quality of the stuff.

Q.—It was better than you expected?

A.—Much better than I ever expected. I think everybody was surprised at that. Of course, that rather prevented me from airing my views any further about the matter.

Chairman.—Did it? Because, however good the quality, the rate was so poor?

A.—Yes.

Q.—Everything depended on the rate?

A.—Yes.

Sir M. Visvesvaraya.—What makes you say that that made things better. The Chairman all the time has been pointing out to you that it did not give the required output. Did you make a definite stand and say that things were to be remedied or did you regard things as being better?

A.—The quality of the material was better than what I expected.

Q.—In what way does that help?

A.—It was going to make a much better filling.

Q.—But it will not improve the quantity?

A.—It did not improve the quantity, but there was a better quality of material coming than I certainly had expected.

Sir Frederick Hopkinson.—Did you not get mud first as the mud was overlying the clay?

A.—No, we started the dredging and the resulting filling was good clay that dried rapidly.

Q.—You started on Block K?

A.—Yes.

Q.—There is no clay at all there according to your own figures?

A.—Well, beautiful fine clay came out.

Q.—There are your figures. These figures are : Block K, mud 2,281,000 cubic yards, clay none?

A.—We were somewhere out here, I think. (*Pointing on the plan.*)

Q.—That is in the same block. Going to the next block, G : Mud 1,578,000 cubic yards, clay none?

A.—Well, the fact of the matter was that when it came out here, with this pipe-line running here, instead of it floating away, instead of it coming out like water, it was solid. We were walking on it an hour or so after it had come out.

Q.—Therefore it could not leak through the sea wall?

A.—No, at least that stuff could not. It would have staunched the sea wall, if anything.

Sir M. Visvesvaraya.—You had misgivings before the dredger started that all was not well?

A.—You mean as regards the quality of the stuff? Yes, I had misgivings before the dredger started, but when I saw this stuff, as I say we were walking about on it very soon after it was deposited, and I was re-assured.

Q.—What did this statement of yours mean : " that the whole show has bust "?

A.—I forget now. That was before we started pumping.

Q.—Will you refresh your memory and answer what that statement means?

A.—That was with reference to the whole of my programme which had been carefully made out. We had bought the material and everything like that and suddenly I was told to reduce the programme by half. I am afraid I was rather put out when I used that phrase.

Q.—It is nothing to do with the dredgers?

A.—No, that does not affect the dredgers. I think the whole letter was a protest against the programme suddenly having been cut down to half.

Q.—Then when you started with the 367 lakhs estimate, did you think it was a reliable estimate and one on which you could work?

A.—I never took it as a working estimate. I took it it was merely an administrative estimate. I realised the first thing we had to do was to make out our project estimates. That was the thing that we set ourselves at once to do.

Q.—You thought a revised estimate was necessary?

A.—It was not a revised estimate. It was a project estimate we required. That was not a project estimate. That was an estimate on which administrative sanction for the work had been given.

Q.—When did you realise a revised estimate was necessary?

A.—That was not a revised estimate, that was a project estimate.

Q.—Your chief says in that very report that the estimate is reasonable and reliable?

A.—This report here?

Q.—He says : " It is a reasonable and reliable estimate." Where was the necessity for revision?

A.—I am not responsible for that. When I went into the matter and began to work things out, the result of my work was the estimate which I put forward in 1922.

Mr. Billimoria.—When did you start preparing that 1922 estimate?

A.—We started as soon as we got in there in 1921.

Q.—It took you over six months to prepare the estimate?

A.—Yes. Each item towards the cost was an estimate in itself in many cases.

Q.—Should not that have been done at the very beginning?

A.—That should have been done in the ordinary course of events instead of Sir George Buchanan's estimate

Sir M. Visvesvaraya.—I will read what he says : " With reference to my estimate of the cost of the work at the present time, I have gone into the matter very carefully and I believe my figures to be reasonable and reliable "?

A.—Well, I did not write that, I had certain work to do. I was told to go there and do the work and I had then to satisfy the accounts people and get sanction. They could not treat that estimate of Sir George Buchanan's as a sanctioned estimate because there was nothing to go on.

Q.—There is nothing said in the despatches of the Bombay Government to the Government of India to suggest that this was a project estimate?

A.—If you call it a project estimate, you may, but there was no detail there. There is nothing of any detail there.

Q.—From what date did you begin to prepare the revised estimate after you joined?

A.—Well, we began preparing it straight away. We had to make all our plans of the various items of work, and as those plans were made the estimates were drawn up. and those were sanctioned as soon as we could get them sanctioned.

Q.—You mean each detailed estimate was sanctioned separately?

A.—Yes. Have you got my estimate there?

Q.—Yes. (*Document handed to the witness*).

A.—I will show you how that comes about. That is the abstract; these were the actual details; and those were the general sort of things we made out. Those were roughed out as you see it there. A special estimate has been done for that; and there is a reference to the sanction of that detailed estimate. You will see that one or more of those items were subject to detailed sanction, and they were all allowed in this estimate here. Many of those items were sanctioned in that one *here*. (The witness explained the estimate to Sir M. Visvesvaraya.)

Q.—Did you prepare a general estimate after all the detailed estimates had been passed?

A.—This is a general estimate. This is the estimate which is sanctioned by the Government.

Q.—First they began to sanction the detailed estimates?

A.—The detailed estimates were sanctioned first. We had to put the cart before the horse.

Q.—Whatever you wanted to get on with you had to get sanction for?

A.—Yes, as soon as possible. In order to be able to carry on what I was told to do, I made arrangements with the Audit Officer and gave him general details for which he sanctioned the expense. The expense was passed as against those details, and when those things were finally sanctioned, the whole of that was written back, so as to correspond to this estimate, so that the accounts would correspond to this estimate.

Q.—Throughout the period after you had joined, you went on preparing estimate after estimate?

A.—Yes.

Q.—When the 367 lakhs estimate was prepared, it was regarded as a reasonable estimate. When you went in for 702 lakhs, did you realise that you could have done the work cheaper by moorum filling?

A.—How do you mean? I do not quite understand your question.

Q.—The total quantity of filling is 28,000,000 cubic yards?

A.—Yes.

Q.—You are now getting moorum at about 1 rupee 8 annas and some pies per cubic yard?

A.—Yes.

Q.—Could not you have done the work as an ordinary dry filling proposition?

A.—No, my hands were tied. There was the plant ordered before I came on to the job.

Q.—Why did you not make any reference to it in the Reports?

A.—Because we had every hope that this was going to come right.

Q.—Even if it had come right and had spent 702 lakhs, it would have been much in excess of what you could do it for by ordinary dry filling?

A.—I do not think we could have done it.

Q.—Will you let me figure out a few points with you? 28,000,000 cubic yards is the total quantity.

A.—Well, I worked it out many a time in train-loads and all sorts of ways, but I have not got the figures now.

Q.—It is a very plain proposition. You have got a sea-wall, and you have got the filling. The filling of 28,000,000 cubic yards is costing 1 rupee 8 annas per cubic yard.

A.—25,000,000, I think it is. Probably there was something off for the top foot.

Q.—That is moorum?

A.—Yes.

Q.—It is 28,000,000 yards.

A.—25,000,000 cubic yards.

Q.—The 28,000,000 covers the moorum also.

A.—All right.

Q.—It is 28,000,000 cubic yards at 1 rupee 8 annas per yard.

A.—1 rupee 8 annas a brass?

Q.—No, a cubic yard. 28,000,000 cubic yards at 1 rupee 8 annas per yard will be 420 lakhs?

A.—Yes.

Q.—The sea-wall was costing about 60 lakhs?

A.—I forget the figure now.

Sir Frederick Hopkinson.—I think you have the wrong figure. It is much more than 64 lakhs.

Sir M. Visvesvaraya.—You are thinking of the dredger.

Sir Frederick Hopkinson.—No, I am thinking of the sea-wall. Sir George Buchanan's estimate of 1919 is 118 lakhs?

A.—The estimate here of sea-wall and rubble mound is 78·14 lakhs.

Sir M. Visvesvaraya.—That is the original estimate.

A.—The gantry was 13 lakhs; that comes in that.

Sir Frederick Hopkinson.—Then there is the quarry?

A.—There is the sea-wall and the rubble mound and the massed concrete wall at Colaba. That is over 100 lakhs.

Sir Frederick Hopkinson.—You will find the rubble mound and wall equals Sir George Buchanan's estimate of 1919, which is 118 lakhs for the sea-wall. You will find it comes very closely indeed to that.

Sir M. Visvesvaraya.—I think Mr. Lewis's estimate is 80 lakhs. 80 lakhs for the wall, 80 lakhs for the quarry and the railway line, and 80 lakhs for all other works and contingencies; so that the whole thing is about 240 lakhs.

Sir Frederick Hopkinson.—No. The first three items come to 101 lakhs. Then the Kandivli Quarry is 18 lakhs. Machinery and buildings 27 lakhs; and 24 lakhs for Marine Lines. Taking the preparation of the site, machinery and buildings and Marine Lines and transport of rolling stock, you will get up to nearly 200 lakhs.

Sir M. Visvesvaraya.—That is the sea-wall.

Sir Frederick Hopkinson.—Yes.

Sir M. Visvesvaraya.—I make it out at about 82 lakhs. I am talking of Mr. Elgee's revised estimate, which comes to 82 lakhs. You are including the works in the Marine Lines.

Sir Frederick Hopkinson.—This is the project estimate I am looking at. You will find the first item is gantry, 13½ lakhs; the next item is sea-wall and rubble mound, 78 lakhs; next, massed concrete wall at Colaba, 10 lakhs. Then the Kandivli Quarry and opening out the quarry is 20 lakhs; machinery and buildings 27 lakhs; Marine Lines machinery and buildings and capital cost of preparation of the site, 24 lakhs.

Sir M. Visvesvaraya.—I have analysed the whole thing, but I have analysed it in a different way to yours. If you had done it with moorum filling, would a costly sea-wall have been necessary at all?

A.—Yes.

Q.—Could you not have done it by rubble and moorum, putting in a wall of rubble and moorum, and then filling in with moorum on the site?

A.—Do you mean could it have been done with dry filling?

Q.—Yes.

A.—I think so.

Q.—If it had been done with moorum filling, would it not have been much cheaper?

A.—My experience of the moorum there was that it was very unsatisfactory stuff to use.

Q.—You did not use any yourself?

A.—Well, we used moorum for some roads, the little trolley lines down by Colaba. We found we had to use stone, as the moorum was not any good. It all melted away as soon as the sea water came up to it.

Q.—Several engineers have recently told us that moorum is better than clay or anything you can pump from the Harbour.

A.—My experience of the moorum which we put into the sea-water was that the roads widened out at the bottom and sank.

Q.—That does not seem to have been the experience of the engineers we have seen.

A.—We certainly had that down at Colaba. I remember that very specially with some roads that we put in near the light railway lines. They simply disappeared. After that we always had to use stone, when we were building anything that had to stand the tide.

Q.—The Chairman of the Port Trust, Mr. Neilson, is also of opinion that moorum is a great deal better for filling than the dredging material which is available there.

A.—It may be.

Q.—The Kay Committee have recommended that so far as possible moorum should be used, even for blocks 2 and 8.

A.—There is a lot of moorum wanted.

Q.—For top dressing?

A.—No; if you are going to dry fill the whole thing in, it is a tremendous quantity.

Chairman.—Nobody has yet put his finger on the place where it is to be found.

A.—No. We were on the look-out. I told Mr. O'Rorke to look to see if he could find anything suitable years ago.

Mr. M. Visvesvaraya.—Mr. Kidd said moorum could be got from a distance of some 10 miles from the work.

Sir Frederick Hopkinson.—That is in the district.

Chairman.—That is Trombay. That is only for a limited amount.

Sir Frederick Hopkinson.—Mr. Kidd said they could get any quantity; but that is over a very large district. Nobody put his finger on the spot.

Chairman.—Nobody has said: "Go there and you will get sufficient face to work the steam shovels, and you can get enough moorum to do the business." Nobody has yet said that.

Sir Frederick Hopkinson.—That is why I advised the Bombay Government to experiment about it.

Sir M. Visvesvaraya.—If we analyse the evidence of two or three people, I think we can come to some conclusion on that point. I, for one, am sure that there are places where it can be found. If you had 28,000,000 cubic yards to do, and you get it done at 1 rupee 8 annas. and we understand that you can get it done now at 1 rupee 4 annas——

A.—I do not know anything about the prices.

Q.—The railway people have told us they would get the moorum up the line—if it was 1 rupee 4 annas, you could easily do the reclamation for 400 or 500 lakhs.

A.—Yes.

Q.—That is a very important point. Has that question ever been investigated by you as an alternative estimate?

A.—No, it did not come up.

Q.—You did not investigate the sources of moorum supply nearer than Kandivli?

A.—No; it was not a matter of actuality in those times.

Q.—Did you make any further surveys after you began the preparation of the detailed estimate, or did you depend upon the original surveys?

A.—All the surveys were made separately. We had surveys of everything, almost—surveys of everything that was done.

Q.—You did not take any fresh borings in the harbour?

A.—No; we did not take any borings in the harbour.

Q.—You depended on the original ones?

A.—They were done every 200 feet, as far as I remember.

Q.—You did not take any trial borings?

A.—No.

Q.—Did you adopt the costing system on the works; that is, take daily costs of what the work was costing you?

A.—No, not daily; but we did it every month.

Q.—Did you do that in the case of the dredging material?

A.—We had a costs system for that.

Q.—How did you calculate the output?—not at site, but only from what you estimated?

A.—We could only go on the measurements got from the soundings.

Sir Frederick Hopkinson.—You did have the quantities taken from the soundings at least once a month for the purpose of your costing?

A.—They were done day by day, I think.

Q.—The quantities were actually taken out?

A.—I really cannot remember the actual details, but the cross-sections were taken.

Q.—We have been told, over and over again, that it was not possible for the engineers to let the Government know the results of the dredging output until the end of the season—that is in August.

A.—I think that was only the final result.

Q.—They could not let them know any result?

A.—Well, it was in the weekly report—at least, I think so—that went home to Meik and Buchanan, and that went through the Director's office.

Mr. Billimoria.—Did you retain any copy at the Director's office?

A.—I think so. Do you remember that detail, Mr. Elgee? I think two copies went.

Mr. Elgee.—Yes; every week—one for the Director and one for Sir George Buchanan

Sir M. Visvesvaraya.—Did Sir Lawless Hepper issue any instructions on technical points to you independent of the engineers?

A.—No.

Q.—What was Sir Lawless Hepper's relations to you?

A.—He was the Director of Development.

Q.—The administrative Director?

A.—Yes.

Q.—Did he control the expenditure?

A.—Yes, ultimately

Q.—Did any of the individual estimates go to him?

A.—Certain estimates were sanctioned by him. Certain went to the Government. What the difference was I am not quite sure; but certain estimates I would sanction. I had powers up to a certain point.

Q.—You had authority?

A.—I had authority to sanction works to a certain point, and then others went to the Director, and I think some went up to the Government of Bombay. Was not that so, Mr. Elgee?

Mr. Elgee.—Yes.

Sir M. Visvesvaraya.—Did Messrs. Meik and Buchanan supply you with any detailed plans and estimates after you were once on the works?

A.—No. The only detailed plans that I remember coming out were for the East Colaba reclamation. Practically, all the designs and all the drawings and all the estimating were done in Bombay. They sent out some plans for the East Colaba reclamation.

Q.—What happened about the East Colaba reclamation?

A.—What happened was this: There was some discussion about it. I sent my proposals to them and they said: "No; this is far too expensive, and we will send you out something which is very much cheaper." They sent me out a set of plans and I went through them, and I did not see how we were going to work them. When Sir George Buchanan came out I put my objections to those plans before him and he quite agreed, and it practically went back to my original plan, so that the economies were not effected.

Q.—Did your estimates go up to Sir Lawless Hepper and the Government through the engineers?

A.—No.

Q.—Always direct?

A.—Always direct.

Q.—How does the responsibility come in?

A.—I do not think that the system was a workable system. You cannot work the thing in that way.

Q.—You say the system was not workable?

A.—Either it has all got to be done in London, and the man on the spot has got to get definite orders that he is to do such-and-such a thing; or else it has got to be done entirely out there.

Q.—The consulting engineers should be on the spot?

A.—That is really what was necessary. Either the drawings should have come from London with everything complete, and perhaps the price might have been filled in in Bombay.

Q.—The arrangement was not workable?

A.—It was not a workable one.

Q.—Do you know that a lot of material escaped through the rubble mound?

A.—There was some.

Q.—Did you know that about nine lakhs of cubic yards escaped through the rubble mound in two seasons?

A.—I did not know that.

Q.—Probably between six and nine lakhs escaped.
A.—I do not know about that.

Q.—That is subsequent to your leaving?
A.—Yes.

Q.—Did you notice the matter in your time?
A.—I noticed that outside the wall there was a certain amount of leakage. You could see there were deposits of silt at low water when it dried up. When the tide was low you could see certain deposits of silt on the seaward side of the wall.

Q.—That showed that something was escaping?
A.—Yes.

Q.—Who made the appointment of engineers generally on the work? Who recommended them, and at what stage was it sanctioned by the Government?
A.—There were very few appointments to be made.

Q.—What was the usual practice?
A.—Well, there were so very few. As far as I remember, I think I had power to appoint up to a certain salary, and that beyond that I had to go to the Director or to the Government.

Q.—To what extent did Messrs. Meik and Buchanan take part in the appointment?
A.—Well, in the majority of cases of European engineers they appointed them—they recommended them for appointment.

Q.—How many officers of the P.W.D. were employed in your time under you?
A.—There was one man—Mr. Philpot Brooks. He was the only man I ever had. He left in or about May, 1921.

Q.—What was the procedure in making home purchases in your time?
A.—I used to indent on Messrs. Meik and Buchanan and they called for tenders and recommended a certain offer to the D.G. of Stores, and the firm making the offer recommended got the order from the D.G. of Stores.

Q.—The Bombay Government did not go into the matter?
A.—No.

Q.—Messrs. Meik and Buchanan were permitted to invite tenders and transmit them with their recommendation to the Director General of Stores?
A.—Yes.

Q.—In Bombay, some of the witnesses said, superfluous stores were purchased. Is that true? Have you any recollection of any stores being purchased in excess of your wants? There is some suggestion about a steam shovel which has not been worked.
A.—I am afraid that shovel was not much use to us, but that was all before I ever came on the ground. It unfortunately was a different gauge to our gauge.

Chairman.—That cost £9,000, did it not?
A.—I believe that was the price.

Sir Frederick Hopkinson.—Did you say it was bought before you came on the ground?
A.—It was bought before I came to London.

Q.—By whom?
A.—The Governor of Bombay so far as I remember. I do not know, as the thing did not pass through me, but I am under the impression that it was purchased from Lord Furness.

Q.—Where?
A.—It was used up at Middlesbrough during the war shifting slag heaps.

Q.—But you made out the requisition list for all the plant required?
A.—Not for that shovel.

Q.—Who ordered it?
A.—So far as I know the Government of Bombay.

Sir M. Visvesvaraya.—It was ordered before you went there?
A.—Yes.

Sir Frederick Hopkinson.—By whom? Was it by Meik and Buchanan?
A.—No.

Q.—Who then?
A.—I think it was the Government of Bombay so far as I remember.

Q.—Do you mean the Governor-General or the Secretariat when you speak of the Government of Bombay?
A.—I think the Governor.

Sir M. Visvesvaraya.—I think it is the Governor himself. There is some correspondence.

A.—I have seen some correspondence about it.

Sir Frederick Hopkinson.—I have never seen any.

Sir M. Visvesvaraya.—There is some correspondence.

Chairman.—Where?

Sir M. Visvesvaraya.—I think in the Bombay Government papers. The Governor himself wired to Lord Furness in the Malay States. He had gone to the Malay States and the correspondence went on by cable, and finally it was closed.

Chairman.—Do you know anything about this, Mr. Ewbank?

Mr. Ewbank.—No.

Sir Frederick Hopkinson.—Have you ever seen this correspondence?

Mr. Ewbank.—I do not remember it.

Sir M. Visvesvaraya.—You will find it in the Bombay Secretariat papers.

Chairman.—We must look into this. This is very important. I would like somebody to give me the papers about it. That cost £9,000.

Sir Frederick Hopkinson.—You speak of this gauge being objectionable, but that does not matter at all, does it?

A.—You see we had not very much room.

Q.—It does not matter about the gauge. It does not run on any railway.

A.—Well, we had our lines in the quarries all one gauge, and it meant a separate arrangement.

Q.—You do not run it about on the railways. You put it down in the place where it is going to work and it stays there for months?

A.—But it would have to shift when you do a blast near it, if it was going to be used in the quarry for loading stone or anything of the sort.

Q.—You would not dream of buying a thing like that for loading stone?

A. Well, I would not, but as I say it was there before I got there. If we were going to load with it it meant that we had to shift it about.

Q.—It is perfectly useless in the quarry, is it not?

A.—It seems so to me. I think we might have got something out of it if it had been more convenient, but we had not got the space to do it. That was not my purchase, however.

Sir M. Visvesvaraya.—There is a complaint in Bombay that you built very substantial houses at Kandivli. Was it necessary to do this for six years of working?

A.—There is a pretty heavy rainfall at Kandivli.

Q.—But at the top of the Ghats, where they are building large dams, they have a large staff but they never go in for such expensive buildings as these?

A.—Well, it was all of rough stone that was got on the site, and mud. You cannot do much cheaper than that.

Q.—Anyhow the total cost was very high?

A.—But, mind you, we had our camp there and we had to have some 1,500 coolies. Housing coolies in Bombay is not the easy matter that it is in some places. They have to live with their families and you have to provide a separate room for each one. It was essential that we should have decent places for them for sanitary reasons. One year we had the plague up at the quarry and it upset the whole scheme of things, as people ran away.

Q.—The Kandivli Quarry was intended for stone primarily for the sea wall?

A.—Yes.

Q.—Was it intended to bring moorum from there also?

A.—Not from the actual quarry. There may have been a little there, but we had not investigated it for that. What we wanted to get was a clean quarry for stone.

Q.—The quarry cost about 40 lakhs, the permanent way and plant cost about another 40 lakhs. Do you think an expenditure of 80 lakhs was necessary for collecting stone for the sea wall. Subject to correction, 80 lakhs was the estimated cost of the sea wall, and you have spent 80 lakhs on equipment to get the material. Was it necessary? I am not criticising, but I want to know the truth about these matters?

A.—What we were sent to do was a certain amount of work to be done within a certain number of days. It was all limited to time and we had to work at high pressure while we were at it. We had to bring the material in a very long way. Of course, if we could have got the stone quicker and easier we would have done so.

Mr. Billimoria.—If you had employed contractors to bring the stone, would not it have been cheaper?

A.—I do not see how they could have handled the quantities that we wanted. You see we used to handle getting on for 2,000 tons a day. Well, how are they to bring it?

Q.—The contractor would have undertaken everything.

A.—Yes, but how would he have done it. It is not his undertaking that is the thing, but how is he going to get it there.

Sir M. Visvesvaraya.—The railway company would carry the stone for you in the railway trucks.

A.—That is the difficulty. They told us that railway trucks could not be provided.

Q.—Did you make a proper investigation?

A.—Yes, that was gone into at the very beginning, I think. Anyway, when I got on to it the question had been decided and we had to get our own rolling stock.

Q.—Why did you retire before the work was completed. We want to know the truth; perhaps you do not mind my asking that question?

A.—I did not get on with Sir George Buchanan. I had reached within eight months of the age limit and I had earned my full pension, and I had not had any real leave for a very long time.

Q.—Was the disagreement on technical or administrative grounds or on general grounds?

A.—It was personal.

Q.—Whose idea was it first to dredge in the Back Bay?

A.—Well, I think I started the idea. I though of it merely to have a second string to our bow.

Q.—Do you know that it is costing very much?

A.—No, I do not know what it is costing.

Q.—Last season it cost 1 rupee 3 annas per cubic yard.

A.—I do not know. I have no information about that.

Q.—Sir George Buchanan complained that you deviated from his programme, did he not?

A.—I think Sir George Buchanan was quite in agreement with our certainly making experiments, and as you see these drawings and things went through.

Q.—He acquiesced in it?

A.—Yes.

Q.—Do you think it was necessary to purchase the " Kalu " and the " Jinga "?

A.—The " Kalu " was bought, I was under the impression, without Sir George Buchanan's knowledge. Well, I will not say without his knowledge, but I understood he was asked whether dredgers like the " Kalu " or " Jinga " could be used for the East Colaba Reclamation, and I believe he said, Yes. On that it was bought. That is as far as I have heard.

Q.—They had no definite idea of how to use it when they purchased it?

A.—Where it was to be used?

Q.—Yes.

A.—I suppose it was going to be used somewhere.

Q.—How could it be used somewhere?

A.—On the reclamation.

Q.—The " Sir George Lloyd " and the " Colaba " were working together. Then when they asked that the " Kalu " also should be put along with them it was said it was not economical. You found it was not economical, did you not?

A.—It meant three bites at a cherry, did it not?

Q.—You do not know how it was intended to use these vessels before they were used in Back Bay?

A.—Do you mean the " Kalu "?

Q.—Yes.

A.—We had various pipe lines there, and it was going to be used.

Q.—They wanted them for the pipe lines?

A.—Yes; if necessary.

Q.—But they had calculated their 5,000,000 yards per annum without the " Kalu "?

A.—Yes; without the " Kalu."

Q.—Did Sir George Buchanan ever tell you why he specified soft clay in his specification for the dredger?

A.—The specification for the dredger was all done before ever I got there.

Chairman.—Sir George Buchanan did not specify soft clay. Sir George Buchanan accepted the specification of Simons. We know they introduced the words " soft clay."

Sir M. Visvesvaraya.—Do you not think they were all of one opinion when the specification was sent out?

Chairman.—The people who first used the words " soft clay " were Simons & Company in the letter of 12th September. Somehow or other that phrase " soft clay " crept into the specification and became part of the bargain. Whether there is any point in the difference between soft clay or hard clay we shall have to determine; but Sir M. Visvesvaraya was asking you whether Sir George Buchanan had ever said anything to you about the specification embodying soft clay.

A.—Not that I remember.

Sir M. Visvesvaraya.—Did you notice in the specification that soft clay had been specified?

A.—Well, I may have done. I really cannot remember. I must have done.

Q.—Why did you not work the dredger in three shifts? A dredger like this is a very costly plant, and contractors usually work such plants in three shifts. Why did it not occur to you to work it in three shifts?

A.—Well, the idea was that we were going to use it for two shifts at first. That was the original idea.

Sir M. Visvesvaraya.—When you found that the output was not satisfactory why did you not resort to three shifts?

Chairman.—But this gentleman never worked more than one shift. He did not increase it even to two.

A.—Well, it meant an increase of staff which, as far as I remember, we asked for. Did not a lot of engineers come out just before I went home?

Mr. Elgee.—I think about that time.

Sir Frederick Hopkinson.—You would not have them out in July to begin work in December?

A.—No; but I think we had asked for them.

Q.—You will find they did not arrive until November.

A.—Yes; but I think in the correspondence you will find we asked for them much earlier.

Sir M. Visvesvaraya.—When the dredger did not give the required output did you inquire whether there was a guarantee in the specification?

A.—Well, the guarantee had already been fulfilled by her dredging in the Clyde, it was not any use out there. The guarantee had been certified as having been complied with by Sir John Biles.

Q.—We know in the case of the " Kalu " they carried out tests in Bombay itself?

A.—I was not aware of that.

Q.—You may take that from me. Do not you think they ought to have done the same thing in the case of a more important plant like the " Sir George Lloyd," and that they should have given a guarantee for test working on the spot?

A.—Well, did Simons get full pay from the Port Trust then, because I have heard it stated that the out-turn of the " Jinga " and the " Kalu " was under the guarantee?

Chairman.—Yes; but the position was this. Simons & Company entered into a contract whereby they undertook to dredge for a certain number of hours in Bombay harbour itself and give the required output. The " Kalu " and " Jinga " were each specified to do 2,000 cubic yards per hour, dredging to a depth of 35 feet which was afterwards extended to 40 feet. Simons took the vessels out, and Simons somehow got the vessels to give the output, and Simons complied with the guarantee. The moment the vessels were handed over to the Port Trust the output became ludicrous. We have all the figures.

Sir M. Visvesvaraya.—I suppose your experience of the working of the dredgers has been too short to give an opinion about the " Sir George Lloyd " and the " Colaba "?

A.—Yes; it was a very short time. I have got the idea at the back of my head that it was represented to Messrs. Meik & Buchanan that the dredger had not done what it ought to have done.

Q.—What action did they take?

A.—Did they not write out then and say it was only the first year and they would want to see what was done in the second year?

Mr. Elgee.—That is in Sir George Buchanan's report.

Witness.—I have seen it somewhere.

Sir M. Visvesvaraya.—There was no question put in a direct way: " the dredger is not giving the required output; there is something wrong with it; come and see what is wrong and correct it. If you want to make any additional charge tell us what it would be. No such question seems to have been addressed to the manufacturers or to the builders?

A.—Certainly not in my time, except that we saw Mr. McMurray who was passing through Bombay.

Q.—There are informal short notes on record, but on the leading facts there has been no correspondence. Why was not a specification prepared for the sea wall?

A.—There was a specification.

Q.—I understood you invited tenders without a specification?

A.—No; a specification was printed.

Sir Frederick Hopkinson.—You are confusing two things. One is the wall at the Colaba end, and the other is the general specification for the other part. There was a specification printed for the Colaba block work, but Mr. Elgee told us there was no specification for the other part of the work.

A.—I was turning over some old papers, and I found the specification.

Q.—Have you got it here?

A.—I have it in London.

Q.—Could you let us see it?

A.—I will send it up.

Sir M. Visvesvaraya.—Who prepared it?

A.—It was prepared in London, I think.

Q.—By you?

A.—Well, I think it was Mr. Meik who did it mainly, and then I went over it with him.

Sir Frederick Hopkinson.—Mr. Elgee built the main portion of the sea wall on marine lines, and he says he has never seen the specification.

A.—Well, as a matter of fact, there was one specification I found for the gantry, and on this thing of mine is a note: "Copy sent to Mr. Elgee," or something to that effect. If you like, I will send it to you.

Chairman.—You might bring it to-morrow.

A.—Yes.

Sir M. Visvesvaraya.—You invited tenders for the sea wall. Why did you not accept one of them?

A.—Have you ever seen Sir George Buchanan's report about it? I have a copy of that if you would like to see it.

Q.—What is your impression about it?

A.—That the proposals were not satisfactory. That was really it. It was not a question of building the wall in a certain way. It was a most complicated proposed agreement. There was a certain number of tenders received—I remember one where the Tata Construction Company proposed to make the blocks in various places. There were three places that they proposed. Then they were going to bring them in through the streets of Bombay on lorries. There were 9-ton blocks. I think it was ruled out on that ground.

Q.—I understood they said they had no proper specifications given to them, and they could not comply.

A.—The specifications were quite complete. That printed specification was quite complete.

Q.—We are trying to find out here the truth about everything in connection with this scheme. You said in the course of your examination by the Chairman: "I could have done a good many things if I had had a free hand." Could you mention some of them? If you had had a free hand what would you have done?

A.—What was that about?

Chairman.—It was about building the sea wall from both ends. I was asking you if you had been an entirely free agent whether you would have built the wall from both ends or from one end alone. Then you said: "Well, if I had been free I would have done a great many things." We will give you till to-morrow morning at 11 o'clock to consider your answer.

(Adjourned to to-morrow morning at 11 o'clock.)

The Committee Assembled at 11 a.m. on Thursday, 14th October, 1926, all members being present.

The examination of Mr. Lewis continued.

Sir M. Visvesvaraya.—Do you remember the last question which was put to you just before we rose yesterday? You gave us some valuable information, and in the course of your replies to the Chairman you said, "I could have done a great many things if I had had a free hand." Will you specify some of those things? It is well that we

should see to what extent you were or were not responsible for the subsequent troubles which ensued?

A.—The subsequent trouble is the failure of the dredging, is it not?

Q.—The character of the organisation and management have also all led up to it to some extent?

A.—The whole trouble is that there is not the material there apparently—or the stuff is not suitable I take it. I have not been out in Bombay for two and a-half years, but I gather from what I hear that that is the case.

Chairman.—You are rather getting away from the question. The question really is this. What had you in your mind yesterday when you told me that if you had been in supreme command you would have done many other things, and, you implied, many other things differently? That was the concluding question which Sir M. Visvesvaraya put to you yesterday, and we invited you to think it over during the evening. What had you in your mind when you gave that answer? What were the things which you would have done differently if you had been in supreme command?

A.—What were my actual words?

Q.—We will turn to the shorthand note if you like, but you may take it that substantially what you said was, " I would have done a good many other things," and that implied—and it was understood by all of us to mean—that you would have done a good many things quite differently had you been in supreme command. What were the things you would have done?

A.—I think, in saying that, that I meant I might have done things.

Q.—You might have done things. That will do quite as well. What were the things you might have done differently had you been in supreme command?

A.—Actually I do not think we should have had the trouble with the estimates. If I had had the whole thing to do, I think I should have gone very much more into the question of the filling that was available, if that had not been settled before I got there.

Q.—The moorum?

A.—No, the filling.

Q.—We have always drawn a distinction in the evidence here between what we have called dredged filling and moorum?

A.—Well, dredged filling. Perhaps I ought to have been more careful in saying a thing like that.

Q.—No, you are here to give us your opinion about the matter. Do not bother about the future. You are here to give us your opinion, and you told us there were things which, if you had been in supreme command, you would have done differently. That was the substance of your answer. We want to know what those things were?

A.—Well, I am afraid that was too general a remark.

Q.—May we get from the general to the particular. Can you give us any one thing which you would have done differently had you been in supreme command?

A.—Well, it is rather difficult to answer.

Q.—Is that a question which you really feel unable to answer?

A.—Well, I feel it is more than I would ever expect to be asked.

Sir M. Visvèsvaraya.—You want to help us in this inquiry?

A.—Yes, in every way I can, but my feeling is that perhaps I spoke a little too quickly in that case.

Q.—Too frankly?

A.—No. It was not a question of frankness. I think I have been frank all the way through, have I not.

Chairman.—But, Mr. Lewis, you were Chief Engineer from the 11th December, 1920, to the 12th July, 1924, and you told us, as an engineer and as a man very high up in the P.W.D. that there were things which you would have done differently. That is what it came to. I am only asking you what had you in your mind when you told us that, and after you have answered we will pass away from it. At this stage of the enquiry you need not be shy about making any criticisms if you believe those criticisms to be well founded?

A.—It is very difficult when, all of a sudden, you bring forward such a question. I have had no preparation for this.

Sir M. Visvesvaraya.—You had the whole of last night during which to think over it?

A.—I had to sleep, and I was in a good deal of pain most of the time I was not sleeping.

Mr. Billimoria.—You must have observed several defects in the work when you were engineer in charge, and you can give us an idea as to how they could have been remedied, or, if you had been in independent charge, what you would have done?

A.—Defects in the work?

Sir M. Visvesvaraya.—In the design, or in the administration, or in the organisation?

A.—I think the organisation was all right.

Q.—That is not what you told us yesterday?

A.—The local organisation, I think, was all right—as regards the carrying out of the work. The trouble was caused by having a sort of divided authority; that is, Messrs. Meik and Buchanan in London and having the work in Bombay. There was great difficulty and we did not always get—well, we were rather left to our own resources to a large extent.

Sir Frederick Hopkinson.—Would not that have been all the better for you, if you could have improved on what was being done, if you were left to your own resources?

Sir M. Visvesvaraya.—Do you want to give a reply to that?

A.—It is very difficult suddenly to be asked " what would you do."

Q.—Was the Kandivli quarry started in order to get stone, or both stone and moorum?

A.—Stone.

Q.—The value of the stone required for the sea wall and other purposes was about 25 lakhs of rupees, according to your estimate. The quarry itself has cost about 50 lakhs, and the transport arrangements about another 30 lakhs—in all about 80 lakhs. Therefore, in order to get stone of the value of 25 lakhs why was this large expenditure incurred? I am not criticising you at all; I just want to get at the truth of this business. I will hand you this document. (*Handing same to witness.*)

A.—Well, you see, there was the question of the stone for the cross walls.

Q.—How much would that be?

A.—The figure here is 660,000 tons. Then you must remember that there was stone for the concrete used on the whole work.

Q.—I think you will find that in your estimate for the sea wall?

A.—No, not all. For instance, there are the storm water drains.

Q.—How much is that?

A.—Here it is only put down at a running foot rate; but anyway there was a very large quantity indeed.

Chairman.—Just a moment. The storm water drains will not help you, because the storm water drains were omitted in the first estimate. It was only after you got out there that you came to the conclusion that storm water drains were necessary; and the Kandivli Quarry venture had been decided upon before any question arose of storm water drains.

A.—You must remember there was a great deal of road building to be done later on, and there would be stone required for very many purposes. It meant large quantities of stone.

Sir M. Visvesvaraya.—They could get stone at nearer hand. You did not have to go so far afield?

A.—We had to get a very large quantity. It was a question of large quantities daily. We had to have control of the quarries in order to be able to send down the stone as it was wanted.

Chairman.—You mean that if you had your own quarry, even if it was going to cost a little more than you might have got it done by independent contractors, from a business point of view it was worth it?

Sir M. Visvesvaraya.—Could not you have arranged for contractors to have supplied stone, and for the railway to have carried it for you?

A.—Well, you see, the main cost of the working of the quarry was done by contract—all the drilling and the sledging and loading. All that work was done by contract, and it was put on to our wagons. The contract price, as far as as I remember, included all labour in the quarry.

Q.—That may be a detailed contract. We are not interested in that. What I want to know it this. You wanted stone worth about 30 lakhs outside. Why did you spend 80 lakhs for the transport? Surely there must be a sense of proportion?

A.—I think your 25 lakhs is an under-estimate of the amount of stone that was ultimately required for the work.

Q.—How much would you put it at, at the outside?

A.—I cannot remember the figures, but even then the arrangement would have been very costly.

Q.—But there must be a sense of proportion?

A.—Yes.

Chairman.—You have to have some security for delivery?

A.—Yes. We had to be able to control the quarry ourselves in order to be quite sure that we were going to get the material. On a big job like that, suppose a dispute had arisen with the contractor and suddenly, in the middle of the working season, he had said to us, " This is all very well, but I cannot carry on," where would we have been?

Sir M. Visvesvaraya.—Somebody else would have taken it if your contract had been a specific thing?

A.—But you do not pick up these men every day. To get a man who can run a big quarry, turning out 2,000 tons a day (which was the idea) takes a lot of doing.

Q.—Why not parcel it out among a number of contractors?

A.—You must remember that we only had a very small length of face. We only had 1,100 feet of face, and to get 2,000 tons a day out of that means very intensive working and you cannot have a whole lot of different contractors working on it. You must have it unified.

Q.—The question of the quarry had been settled before you took it up?

A.—The state of affairs when I got to Bombay towards the end of June was this. I was asked to look into the question of quarries——

Sir Frederick Hopkinson.—That would be in 1921?

A.—No, June, 1920. I was given some papers to read, which were some reports by an officer of the Bombay Public Works Department, who had been told to go into the question of quarries which would be useful. He had evidently gone into it, and he mentioned three. There was one at Anderi, another at Gilbert Hill, or something like that—anyway there were three. He explained that the requirements of the work were stone and moorum, and that the idea was that there should be so much of stone and so much of moorum. He said in connection with two of these places, that although they provided those requirements the trouble was that the moorum was on top and that the stone was wanted first. It seemed to me wrong, so I went out with Major Johnson and Mr. Philpot Brooks, and I said : " This is all very well, but I do not want moorum now, and we cannot dig down for the rock. What I want is a rock face. Let us go and see this No. 3 quarry," which the man who was reporting on it said had not got any moorum and therefore was not of any use. I think that is it, as far as I remember. I went out to No. 3 quarry and found this magnificent mass of rock with a sheer face to the east, which was eminently adapted for a quarry. The only thing against it perhaps was the short length of face, which, of course, could be overcome by intensive working.

Sir M. Visvesvaraya.—My only point is the disproportionate expenditure on the quarry and the arrangements made as compared with the amount of stone required?

A.—That was the best quarry we could find at the time.

Mr. Billimoria.—Do you suggest that no contractor would have undertaken this job at a much cheaper rate than what the Department has spent on it?

A.—I do not know. I was told we were to do it departmentally.

Q.—Contractors have given evidence before us, and they have said that if they had been asked they would have done it very much cheaper. Were they approached?

A.—I do not think so. We were told we were to do it departmentally.

Sir M. Visvesvaraya.—Anyhow, you made no investigation about moorum?

A.—No. I knew that actually on the sites which we had for the stone quarry there was a certain amount of moorum, but nothing large enough, and, of course, moorum at that date was a matter of many years ahead.

Sir Frederick Hopkinson.—No, you wanted moorum at that time, because you had no room down at Back Bay for making blocks, or doing anything.

A.—For making blocks?

Q.—Yes—getting your accommodation, your railways, and everything else. You wanted moorum. You made several complaints that you had no room to do anything down there.

A.—Well, we did not use much moorum down at Colaba. It was mostly quarry spoil instead of moorum, because we found that where we had used moorum down at Colaba it gave us great trouble in keeping up banks, and things like that. It sank so much.

Sir M. Visvesvaraya.—Have you thought over my question of yesterday about the alternative cost of dry filling?

A.—No; I have not been able to do that. It is a very big question. You have told me a few particulars, but it is quite possible that, on consideration, I might have to ask you another half a dozen questions as to what you mean or as to what you intend. It is a very large thing to ask me.

Sir M. Visvesvaraya.—It is a very important point, but if you do not want to answer——

Chairman.—It is not that he objects to answering, but I think his first objection would be, " I have no local knowledge which would justify me in saying where moorum can be found in any particular place."

A.—Yes.

Sir M. Visvesvaraya.—He has been several years on the work.

A.—I was not looking out for moorum all the time. I had many other things to do, besides which the question of dry filling did not exist for us. It is only quite lately that any question of dry filling on a large scale has been contemplated. I have not got them now, but I remember making out some ideas as to what the filling would amount to in train loads, and it was a gigantic figure. You must also remember that we were tied down very much by the Bombay Baroda at that time.

Q.—Could not you get trains at night?

A.—They were very averse to giving us even two trains a day.

Q.—It only meant organisation and correspondence and Government influence?

A.—No. More trains would have meant a great deal more rolling stock. When we went out there the idea was one train a day. I remember going to see the Bombay Baroda people about it, and their idea was that they would endeavour to give us that, but we had to find our own wagons for it. That was in 1920.

Q.—Anyhow, you never thought of the question on the larger scale?

A.—No, it was never considered.

Q.—A question has been raised in Bombay about in whose name the invoices and packages connected with the dredger arrived in Bombay?

A.—I think, as a matter of fact, there was a good deal consigned to the Chief Secretary. I think I remember a certain number of packages coming consigned to the Chief Secretary, but I could not tell you at this date.

Q.—The question has been made much of in Bombay?

A.—What is the point? I mean, why is this question asked?

Q.—It is said they came in the name of one authority—one particular party.

A.—Oh, you mean the things being labelled " Sir George Lloyd." That was because they were for the dredger " Sir George Lloyd."

Chairman.—I do not know that we are entitled to talk about what has appeared in the newspapers, but the statement was made in evidence in Bombay that packages addressed to Sir George Lloyd were so addressed because " Sir George Lloyd " was the name of the dredger?

A.—Yes, the same as things for the " Colaba " would probably have been labelled " Colaba."

Chairman.—It is perfectly credible, and I should have thought an entirely satisfactory explanation, and the usual and proper course.

Sir M. Visvesvaraya.—Who negotiated the contract for the purchase of the cement?

A. Sir Lawless Hepper. That was done by the Directorate.

Q.—You had no part in it?

A.—No. I was asked what amount of cement I should require year by year, and I was then told that there was a suggestion that it should be got by means of a contract, which depended, as far as I remember, on the cost of manufacturing the cement, plus a percentage.

Q.—When the operation of the dredger was begun in December, 1923, did Mr. McMurray help in the operation?

A.—I do not think he was there.

Q.—He was in Bombay at the time of the opening ceremony, I understand?

A.—I could not say. My idea is that he was there later. Sir George Buchanan was not out until rather late that year, I think. I remember Sir George Buchanan and Mr. McMurray being there together. It might have been that Mr. McMurray landed in Bombay, and then went somewhere else and came back again, but I do not remember that he was there.

Q.—Did they co-operate and try to make the dredger work properly? Did they co-operate and help each other?

A.—Who?

Q.—Mr. McMurray and Sir George Buchanan—from your own observation?

A.—I think they did make some suggestions.

Q.—Have you refreshed your memory regarding the specifications for the sea-wall?

A.—Yes, I have found them. *This* is the one of which you know already. *That* is the Colaba end. *Here* is a copy of the specification of the northern section; that is,

the Marine Lines end. It was made up in 1920 in London by Messrs. Meik and Buchanan. It was mostly Mr. Meik. That referred to the work as originally proposed. That is the large 20-ton concrete blocks, and various things like that. That got out of date. When we really came to do the work there were so many alterations that that really was out of date, and I am afraid it was not brought up to date.

Chairman.—Will you hand me those. I will mark them and they will be returned to you. You had better put them in and we will have a look at them and they will come back to you.

Sir M. Visvesvaraya.—What do you understand to be the difference between "the engineers" and "the consulting engineers"? Messrs. Meik and Buchanan were consulting engineers first. Afterwards they became "the engineers."

A.—I think Sir George Buchanan always maintained that they were the engineers for the work all the way through, from start to finish.

Sir M. Visvesvaraya.—What do you think is the difference between the two designations—"the engineers" and "the consulting engineers"? Under which of those categories do Messrs. Meik and Buchanan come, in your opinion?

Chairman.—One moment. That is a matter of the construction of the contract, which is for us. We must not, on a point of construction, seek help from any of the witnesses. We shall get into deep water if we do.

Sir M. Visvesvaraya.—Did you call them "the consulting engineers" or "the engineers"?

A.—I am afraid I used both terms.

Chairman.—On one occasion you got a little rap over the knuckles politely by Sir George Buchanan, who said: "The chief engineer seems to have misunderstood our position. We are not consulting engineers: we are the engineers actually responsible for the work." That is the letter of the 22nd July, 1923.

Sir M. Visvesvaraya.—You regarded them as consulting engineers practically. If you did all the estimating and everything yourself, and if you did not send any papers to them, they could not have been the engineers, could they?

A.—I did send papers to them.

Q.—You sent some papers, but your final estimate did not go to them?

A.—I handed that in to Sir Lawless Hepper. That was in May, 1922, I think.

Q.—In your estimate you referred to "consultants' fees." You meant them, did you not?

A.—Yes. I am afraid that it was mixed up a bit. It was not quite clear. I do not know how I should have put that in. There were other consultants besides Messrs. Meik and Buchanan.

Q.—Who were they?

A.—Sir John Biles. He was a consultant, and there was the town planner.

Q.—But the bulk of the expenditure was on this firm?

A.—I suppose if I had had a solicitor at hand I might have written things differently.

Sir M. Visvesvaraya.—We want the truth. We do not want solicitors.

Sir Frederick Hopkinson.—I think you told us yesterday, Mr. Lewis, that you belonged to the Burma P.W.D. What is the difference between that and the Indian P.W.D.?

A.—There is no difference except that I was stationed in Burma. I was allotted to the Burma Provincial Cadre.

Q.—You might have been anywhere in India?

A.—Yes. When I got my appointment from Coopers Hill, there were a certain number of provinces to choose from, and from those I chose Burma.

Q.—So it is really all the same?

A.—Yes. It is now called the Indian Service of Engineers, I think.

Q.—What is the retiring age?

A.—Fifty-five.

Q.—You told us that you were on the eve of retirement in the middle of 1924?

A.—Yes.

Q.—That would make you about 57 now?

A.—I shall be 57 next March.

Q.—Your first connection with this work was in the middle of 1920, was it?

A.—Yes.

Q.—What were you doing before that?

A.—I was Chief Engineer in Burma in the Public Works.

Q.—From what date?
A.—From November, 1919.

Q.—For quite a short time, then?
A.—Yes, but that was my permanent position in the Department. I was Chief Engineer and Joint Secretary to Government.

Q.—But not before 1919?
A.—No. Before that I was Superintending Engineer in what was known as the Delta circle.

Q.—That also was in Burma?
A.—Yes.

Q.—When did that commence?
A.—That commenced in 1919, too. I originally belonged to Burma, and in 1914 I was asked by the Government of India whether I would accept the post of Superintending Engineer at the Imperial capital at Delhi. I arrived there in December.

Sir Frederick Hopkinson.—I think we shall get on better if you just answer my questions.

Chairman.—Just let him finish first. For how long did you stay at Delhi?
A.—I was there until August, 1916.

Q.—Then you went off to Mesopotamia?
A.—Yes.

Chairman.—Then you come back from Mesopotamia, go to Burma, then are called across to Bombay, no doubt on account of this matter, and you arrive in Bombay some time in June, 1920. That brings the history up to date.

Sir Frederick Hopkinson.—Then you were in Delhi from 1914?
A.—Yes.

Q.—During the war, in 1916, you went to Mesopotamia constructing works for the landing of troops, and so on?
A.—Yes. I was constructing the port at Basra at first, and then I was Director of Irrigation.

Q.—That, of course, would be nothing like the Back Bay reclamation? During war time it would be a case of doing something actually required at the moment, with military labour to a large extent?
A.—No, there was very little military labour.

Q.—Under military direction?
A.—No. We all had various titles.

Q.—It was of a military character? You were put into uniform?
A.—Yes.

Q.—Previous to 1914, what was your experience?
A.—I was Superintending Engineer from, I think it was early 1913.

Q.—From April, 1913, to 1914?
A.—For most of that time I was in charge of the irrigation circle in Upper Burma.

Q.—And previous to 1913?
A.—From 1911 to 1913 I was Executive Engineer in Upper Burma. I had the Mandelay Division.

Q.—And previous to 1911?
A.—For a short time I was Under-Secretary, P.W.D., in Rangoon. Previous to that——

Q.—I have not got the time. From 1911 to 1913 you were Executive Engineer in Upper Burma. Before 1911, how long were you Under-Secretary, P.W.D.?
A.—Only a short time. I rejoined the Public Works on the 1st January, and I think I went up to Maymyo in April.

Q.—What shall I put down? How long were you Under-Secretary in the P.W.D.?
A.—Only for about four months.

Q.—And previous to that? You said just now that you rejoined the Public Works Department. Had you left them?
A.—No. I was on deputation with the Port Trust in Rangoon.

Q.—For how long?
A.—From the end of 1907.

Q.—From 1907 to 1911 you were on deputation with the Rangoon Port Trust—what doing?
A.—The Rangoon Training Works—the training wall.

Q.—I thought that was before 1907?
A.—No.

Q.—At any rate, it was some time in 1907. If I remember rightly, that was a stone wall built to train the river to run in a certain direction. Were you in charge of the quarry there?

A.—I was in charge of the quarry first of all, and then for a time I was in charge at the Rangoon end.

Q.—It was a simple operation, was it not? You set out the training wall, you quarried the stone, and you put it into barges and dumped it on a certain line?

A.—It was a little more than that. It was founded really on mattresses.

Q.—You put the mattresses down first, and then the other things follow in their course?

A.—Mattresses, then stone, then the stone was dumped from the hoppers.

Q.—There was nothing in the shape of constructive work, except the small piece of wall above high water level, was there? It was a rough wall, was it not?

A.—It was a concrete wall. As a matter of fact, that was done after I left.

Q.—Then we need not trouble about it. Now, previous to 1907 what were you doing?

A.—I was in the P.W.D. I had charge for 4½ years of a Division.

Q.—Would you mind giving me the years of that?

A.—From the beginning of 1903 until 1907. I forget the date in 1907.

Q.—What kind of works were you doing in those years from 1903 to 1907?

A.—All sorts—embankments, flood embankments.

Q.—Earth embankments?

A.—Yes, navigation canals, locks, and all sorts of things of the kind pertaining to navigation works. Then the roads and buildings in the district.

Q.—Something like the Royal Engineers? They do everything, do they not?

A.—We had to turn a hand to anything that turned up.

Q.—This was all under the P.W.D., and all done departmentally, or was it done by contract?

A.—It was generally done by petty contract.

Q.—Apparently quite small things?

A.—Yes. There was not anything large. One year we might have three or four miles of embankment to do, and that sort of thing.

Q.—I should call that a small work requiring no special knowledge.

A.—It required a great deal of careful work.

Q.—You mean setting out?

A.—Not only setting out, but seeing that the work was done properly.

Q.—Digging a ditch and forming it into a bank. Was that it?

A.—Yes.

Q.—Will you now tell me what you did previous to 1903?

A.—I was on leave for a few months. Before that I was constructing the Mandelay Canal—the irrigation canal.

Q.—In what years?

A.—I went on that at the end of 1896, I think.

Q.—From 1896 to 1903. I do not think we need go any further than that. What I am really trying to get at is this. You told us yesterday that Sir George Buchanan made very flattering remarks to you about the reason why he wished you to take charge of this Back Bay reclamation. I wanted to see really what experience you had had of large works of anything like the Back Bay reclamation which would warrant him suggesting that you should be put in charge of the carrying out of such a large and important work as the Back Bay reclamation; and I think we have got that now. You were in England in August, 1920, preparing the schemes for carrying out this work. Is that so?

A.—Yes.

Q.—With Mr. O'Rorke, assisting you?

A.—He came in afterwards.

Q.—In order to do that, were you given a copy of Sir George Buchanan's report of September, 1919?

A.—We had it in the office.

Q.—Did you have the assistance of Sir George Buchanan in doing it?

A.—For a short time.

Q.—How long?

A.—He left, I think, on the 25th August.

Q.—Would it be a correct description if I said that you were given Sir George Buchanan's report and told to frame methods of carrying the work out?

A.—With Mr. Meik's assistance. Mr. Meik was, of course, the senior partner of the firm.

Q.—Did Sir George Buchanan have anything to do with designing the way the works were to be carried out—Sir George personally, I mean?

A.—I think he left most of that to Mr. Meik.

Q.—I am asking you if he had anything to do with it personally?

A.—No, I do not think so.

Q.—Did he give you any general instructions before he went away as to how he wished the work to be done?

A.—No, I was working that out with Mr. Meik.

Q.—I am asking you, did Sir George Buchanan give you any general instructions as to how the works were to be carried out before he left on August 25th? The answer is yes or no.

A.—I do not remember anything in writing.

Q.—Did he give you any verbal instructions?

A.—It is a long time ago. We naturally talked it over.

Chairman.—Have you any recollection of his having given you verbal instructions, and, if so, on what particular subject?

A.—Only in a general sort of way, I think.

Sir Frederick Hopkinson.—You mean a conversation?

A.—Yes.

Q.—Did he have a conversation with you?

A.—We had many conversations as regarded how the work was done.

Sir Frederick Hopkinson.—That is what I am wanting to get at.

Chairman.—In August, 1920?

A.—Yes, before he went.

Q.—One of the witnesses has said that you arrived at Sir George Buchanan's office about August 20th?

A.—No. It was much earlier than that. It was in July that I arrived. I want to think it out. I left Maymyo on the 20th June, and I think I got to Bombay on the 27th. I think I left by a steamer on the 3rd July.

Q.—Then you would be in town on the 20th July easily?

A.—Yes, easily. It was in July.

Sir Frederick Hopkinson.—Had Sir George Buchanan a clearly defined scheme for doing every detail of this work? Did he tell you that he wanted a gantry here and he wanted to use so many trucks there, and locomotives here, and so on? Did he give you any detailed particulars?

A.—No. I think I worked those out with Mr. Meik.

Q.—But the report of September, 1919, was Sir George Buchanan's only, and not Mr. Meik's. Mr. Meik had nothing to do with it?

A.—I do not know.

Q.—He was not a partner at that time?

A.—Yes, I think so.

Q.—In 1919?

A.—Yes.

Sir Frederick Hopkinson.—Did Sir George Buchanan ever show you details of his original estimate of September, 1919?

A.—I do not remember ever having seen that.

Q.—Did he tell you he had made such an estimate in detail? It would be a fairly large number of papers required to give it in any detail.

A.—Yes; I do not remember ever having seen it.

Chairman.—That is not the question. Did he tell you that he had in fact made out a detailed estimate showing how 367·61 lakhs was arrived at?

A.—I cannot remember that he did.

Q.—Consider for a moment. If he told you must you not have said: "Give me the document"? Must you not have asked for the document?

A.—I did not get any document.

Q.—Does not that satisfy you that he could not have told you that there was such a document? You would have asked for it at once, would you not?

A.—Well, he probably would have shown it to me.

Q.—If he had not shown it to you would you not have asked for it? Must not the answer be "Yes"?

A.—Yes.

Sir Frederick Hopkinson.—Did he give you all the papers and drawings in connection with the scheme?

A.—I had access to them, whatever there was.

Q.—You had access to the whole of the papers in connection with the scheme?

A.—Yes.

Q.—You never saw any detailed estimate?

A.—No; I did not see any detailed estimate.

Q.—Do you know if there were any cross-sections included in that original set of drawings across the reclamation other than those shown in the pocket of his 1919 report?

A.—I think that what they had was the sections taken by Mr. Kidd only.

Q.—Had they any others?

A.—Not that I remember.

Q.—Was there any longitudinal section along the sea wall?

A.—I think there was a longitudinal section, but I do not think it was levelled at that time.

Q.—You do not think it had been levelled?

A.—Not by Sir George Buchanan.

Q.—Did he get one from Mr. Kidd's plans?

A.—I think so.

Q.—In his report he complains of the want of detail in Mr. Kidd's report. I want to get at the fact as to what other detail he gave?

A.—I do not remember any.

Q.—Whose idea was it to build the sea wall from a gantry?

A.—I think that was Mr. Meik's.

Q.—Not yours?

A.—No. I think that was already settled in Sir George Buchanan's report.

Q.—That he was going to build it from a gantry?

A.—I think so. I am not quite sure, but I think so.

Q.—I do not remember it.

A.—Did not he say it was going to be built by a gantry?

Q.—Why need you build a gantry for the Colaba part of the sea wall except for the first 2,000 feet which was above low water level and on rock?

A.—The reason was that there was a very great deal of rock there, and it would have been very difficult to drive the piles into the rock.

Q.—I see it was originally Sir George Buchanan's intention to put what he calls a timber staging?

A.—Yes.

Q.—The Colaba end was done without a timber staging or gantry?

A.—Yes.

Q.—Quite successfully?

A.—Yes.

Q.—Economically?

A.—I think so.

Q.—Where was the necessity for a timber staging or gantry?

A.—Well, at Colaba we started practically from ground level. At the Marine Lines end we were very many feet above the level. We were at the southern end, I think, within a foot or so of the ultimate reclaimed level.

Q.—Was not the stage primarily required for carrying a 20-ton crane?

A.—I cannot remember now what the original idea was, but when it came to a question of investigating I came to the conclusion that we could not put the 20-ton crane on the gantry. It would have meant such an enormously more expensive one.

Q.—This is Sir George Buchanan's report of 1919: "A timber staging to be built in sections across the whole line of the wall, the staging to be wide enough to carry a line of railway and a 20-ton crane." I believe ultimately that 20-ton crane was not required at all.

A.—Well, it was used.

Q.—But not required, because you did not use any 20-ton blocks?

A.—We did not use any 20-ton blocks, but it was a crane, I think, of 50 feet radius. It was used, and it came in very useful.

Q.—Having it there you used it?

A.—Yes.

Q.—It was ultimately found that 3 to 5 or 7-ton blocks were ample for the requirements?

A.—Yes.

Q.—Therefore I say the 20-ton crane was not essential?
A.—No; it did not prove essential.

Q.—I suggest to you that that gantry was entirely unnecessary. There was no reason why you should not have built the wall at the Marine Lines in the same manner that you built it at the Colaba end; that is, without a gantry. Could not you have made a short incline down from the finished level down to the level of the top of the ground?
A.—Yes; and then we should have had to take that away to get the concrete wall on.

Q.—Of course you would, afterwards—you would do exactly as you did at the Colaba end. You did it there, did you not?
A.—Yes.

Q.—There is no difference in the section of the wall?
A.—No; it was only a question of access.

Q.—That is a detail, is it not?
A.—Yes.

Q.—My suggestion to you is that that gantry which cost £90,000 was entirely unnecessary, and was devised apparently by somebody in London who had not seen the site and did not realise that it could have been done without that gantry. After all, it is a very simple matter to tip a rubble mound, is it not?
A.—Yes; it would have meant——

Q.—It would have meant what you did at the Colaba end?
A.—Yes.

Q.—Transferring the stone from side wagons to end wagons and tipping them?
A.—Yes.

Q.—There have been plenty of cases where such work had been done?
A.—Yes.

Q.—It is essentially a simple and easy way of doing the work?
A.—The only question was the difference of level, and that amounted to something like 8 feet.

Q.—That is quite a small thing. An incline of that kind could be made of 1 in 25 or 1 in 30, so that you could have got down in about 250 feet?
A.—It was quite a small thing.

Chairman.—We have not got the answer yet. You heard Sir Frederick Hopkinson's question. In your opinion, sitting here to-day, was the gantry necessary or unnecessary?

Sir Frederick Hopkinson.—Considering it cost £90,000.

A.—(*After a long pause.*) It was, of course, very convenient to us in many ways.

Chairman.—Convenient; but convenient at a price of £90,000! Apart from convenience, was it necessary. Sir Frederick Hopkinson has suggested to you you could have built the wall at Marine Lines in the same method you adopted at Colaba, making an incline of some 200 feet. Is not that so?
A.—That is a question of opinion, is it not?

Q.—I am asking you as an engineer, and as the chief engineer at the time, whether the gantry was a necessity or not. You must answer, please. You must tell us. What is your actual opinion to-day? You have heard how Sir Frederick Hopkinson has put it. Was the gantry a necessity or not? We must get along. We are taking a great deal of time over this.
A.—As a matter of fact, this is the first occasion that I have considered it.

Sir Frederick Hopkinson.—Is it not such a simple thing that it does not need consideration. I am not blaming you in any way. You were told this work was to be done by a gantry and you designed a gantry to do it.

Chairman.—Let us see if we can put it in another way.
A.—I was trying to think whether we did not consider some other ways. I know I did have a conversation about it with a gentleman who was a contractor in London in Mr. Meik's office. As a matter of fact, it was Mr. Railton, of Topham, Jones and Railton. He had done work at Swansea under the same firm of Meik and Buchanan. He made a suggestion rather of that kind.

Q.—It was not exactly the same?
A.—But of that kind. And I remember telling Mr. Meik about it and asking him what he thought about it. He said: "Oh, no, that will not be anything like convenient," or something to that effect. He would not consider it.

Q.—He preferred the gantry?
A.—Yes.

Chairman.—We still come back to the question: Was that gantry, in your opinion, necessary or not? We must have an answer to it.
A.—(*After a pause.*) It was quite possible to have done without it

Sir Frederick Hopkinson.—You have proved that it was by doing without it at the Colaba end?

A.—Yes; but, as I say, the circumstances were not quite the same.

Q.—But practically the same. You could get over a little difference in circumstances quite readily and at some small expense?

A.—Well, we did, and we could have done it.

Q.—During the whole course of the time that you were there did you look upon Meik and Buchanan as the engineers in sole charge of the work?

A.—Yes. I mean that was the position as laid down, was it not?

Q.—Did you in all cases take instructions from them as to how the work was to be done?

A.—Well, generally, you see, things did not come from London, and I had to prepare them in Bombay.

Q.—That is not quite what I meant. Did you generally take instructions from them as to how the works were to be carried out—not designed. Put that aside for the moment. Did they or you decide how the work was to be done and what means were to be employed?

A.—Well, I think I generally devised the means, and in many cases, where it was necessary the matter was talked over with them.

Q.—In other words it was put up to them for approval?

A.—Yes.

Q.—That is it?

A.—Yes.

Q.—So that really you looked upon them as the actual responsible engineers in charge of the work and you would take instructions from them?

A.—Yes.

Q.—Throughout?

A.—Yes.

Q.—From anybody else?

A.—Well, you see, I was rather in the unfortunate position of serving two masters.

Q.—That is what I want to get at?

A.—I was a servant of the Government of India, or, rather, of the Government of Bombay.

Q.—But under Meik and Buchanan?

A.—Well, no, I was not—well, I was to a certain extent under Meik and Buchanan. It was rather a difficult position which was not really adequately defined at the first.

Q.—Do you think it was a good arrangement?

A.—No, I do not.

Q.—Do you think it was a bad arrangement?

A.—I think it was a very uncomfortable arrangement.

Q.—Do you think it was a bad arrangement?

A.—I do not think it was a good one.

Q.—Was it injurious to the works. Your Chief apparently was 3,000 or 4,000 miles away?

A.—I do not think it was a good arrangement.

Q.—Not a good working arrangement?

A.—No.

Q.—Do you think that the man in sole charge of the works ought to have been resident on the spot?

A.—Yes. I do not see how you can take responsibility unless you are actually on the spot.

Q.—Unless you have the power?

A.—Yes.

Chairman.—He said : unless he was on the spot. You are speaking about locally?

A.—Yes.

Q.—Unless you are on the spot locally?

A.—Yes.

Sir Frederick Hopkinson.—You can have power for carrying out certain sections on the spot and still ultimate power may be in London. So long as you are given a clearly defined thing to do it is your responsibility to do that, being on the spot?

A.—Yes.

Q.—But that need not detract from the responsibility attaching to the individual who gives you those instructions?
A.—No.

Q.—So that the people in London may be ultimately responsible to Government and you responsible to the engineers in London. That is a satisfactory way of working the arrangement, is it not?
A.—Yes.

Q.—But did that apply in Bombay? Did you get orders from anybody but Meik and Buchanan?
A.—Well, I was under the Director of Development, administratively.

Q.—But he has told us that he did not interfere in any technical questions?
A.—In some cases I remember Sir George Buchanan asked me to consult the Director of Development and to let him know what his decision was.

Q.—On engineering matters?
A.—Well, on one occasion it was a question of the supply of plant, and I think on another occasion it was on construction matters.

Q.—Do you take the responsibility for the supply of all the plant to the Bombay Reclamation? You made out a list of plant before you went out there?
A.—Yes.

Q.—Do you take responsibility for that? Were you entirely responsible for it?
A.—Well, Meik and Buchanan were responsible for it.

Q.—For the original estimate—the original list. Who actually made it out?
A.—It was done in their office.

Q.—Who actually made it out?
A.—I think I did.

Q.—And you made subsequent additions to it from Bombay?
A.—Yes.

Q.—Do you take the responsibility for them?
A.—Yes.

Q.—Had you ever in your life had such a job to do, to make out a plant list of such a large work as this?
A.—Yes.

Q.—Which one was that?
A.—At the Kalagouk Quarries on the Rangoon River Training Scheme.

Q.—But did not Sir George Buchanan do that?
A.—No, I did that very largely myself.

Q.—Anywhere else? Quarries are comparatively small. I mean the whole thing, locomotives, cranes, gantries, road, general lay-out, and all that sort of thing?
A.—Well, I have done a certain amount—in fact a good deal of construction.

Q.—This is quite a big thing ?
A.—Yes, I had one at Delhi. That was a big thing.

Q.—In the way of plant?
A.—Well, there was a good deal of plant there.

Sir M. Visvesvaraya.—You were not in sole control there?
A.—No, I was Superintending Engineer under Sir Hugh Keeling.

Q.—From what year?
A.—1914 to 1916.

Sir Frederick Hopkinson.—What was the work in Delhi?
A.—It was the building of the new capital.

Q.—Did you require locomotives and cranes?
A.—Yes. We had many, many miles of railway.

Q.—What gauge?
A.—It was 2 feet 6 inches.

Q.—That is an unusual gauge, is it not?
A.—I think there was a certain amount of plant available from the Simla Kalka Line. So far as I remember that was the reason why it was used. It meant very big supplies of material, bricks and things like that.

Q.—When you were in London in 1920 did you see any longitudinal section showing the surface of the ground where the storm water drains were to be put?
A.—No.

Q.—Did you take out any quantities for any storm water drains?
A.—No, I did not take any quantities.

Q.—Did you ultimately do that in Bombay?
A.—Yes.

Q.—You had to take longitudinal sections?
A.—Yes.

Q.—Design the actual culverts and devise methods of doing the work?
A.—Yes.

Q.—Do not you consider that was part of Meik and Buchanan's work?
A.—Yes. There was a little confusion about that. At one time it was suggested that that work should not be done by Meik and Buchanan as it was not part of the reclamation.

Q.—Not part of the reclamation?
A.—That is what I was told, and my instructions were that I was to do it.

Q.—Whom did you get those instructions from?
A.—From Sir Lawless Hepper. Then I started on those in 1922. We started making the drawings in 1922. Then when I had practically finished the work, all except perhaps the particular estimates for each particular drain, when the work was really started, I was told that they had come to the conclusion that the work was to be done by Meik & Buchanan. That is when Sir George Buchanan was over there in 1922-23.

Chairman.—Who were " they "?
A.—At that time there was Mr. Halcrow, who is now a partner in the firm.

Q.—Who is " they "? Mr. Halcrow and who else?
A.—Sir George Buchanan.

Q.—What year was this conversation?
A.—I think it was in 1923.

Sir Frederick Hopkinson.—That is three years after you had made out the original plans showing how the work was going to be done.
A.—You mean the main work?

Q.—Yes.
A.—Yes.

Q.—I think you said that the storm water drains were designed in 1922?
A.—Yes.

Q.—That would be two years?
A.—The work started in 1922. I do not say that a detailed estimate and a detailed plan was ready then. Work was started then.

Q.—Does not that account for the dredger not being able to commence work until December, 1923?
A.—I do not think so.

Q.—Was not there a storm water drain right across block 8, 2,300 feet long?
A.—That one down to the south—1a.

Chairman.—Storm water drain No. 1a?
A.—Yes.

Sir Frederick Hopkinson.—Why is it called 1a. Had it been forgotten?
A.—I came to the conclusion that we wanted more at that particular point.

Q.—Therefore it was an interpolated drain?
A.—Yes.

Q.—Covering the site of where the first reclamation was to be made by the " Sir George Lloyd " dredger?
A.—Yes.

Q.—During the time you were in London in 1920 was any programme given you as to how the dredgers were going to work or the general scheme of the reclamation—where they were going to begin?
A.—No, I think that came very much later.

Q.—Was not it known then?
A.—Not in more than a general sense, I do not think.

Q.—Do you not think that the procedure in August, 1920, should have been: " Here are the plans of this reclamation work. We are going to build this wall in such and such a method to this section, and we are going to start the dredger over there, and we are going to begin the reclamation here. Fill up that block and see the work through to a finish." The whole thing could have been done in half an hour. Do not you think you ought to have had some general programme of that kind? Was such a programme given to you?
A.—Well, there have been so many programmes.

Q.—But I am speaking about the early days. We will come to those others afterwards?

A.—No, I do not think there was a programme given to me. I cannot remember one.

Q.—Did Sir George Buchanan ever tell you exactly how he proposed to do the work?

A.—Only in general terms.

Q.—Can you give us any idea of those general terms? Was it anything more than a bald statement that the dredger was going to pump filling into an area enclosed by a sea wall?

A.—Well, I think there was more than that even in Sir George Buchanan's report, was there not?

Q.—Before 25th August, 1920, when Sir George Buchanan went abroad, did he add substantially anything to this report of his of 1919?

A.—I cannot remember that he did.

Q.—Surely you would remember if he had done so?

A.—I do not think he did. That was what practically I had to found any scheme that I made on.

Q.—You were given that report and the few plans that accompanied it and told that you were to get out the details and carry out that work as Chief Engineer?

A.—Yes.

Q.—In the design of these storm water drains they cost 64 lakhs. The estimate for them was 64 lakhs, which is roughly half a million. Two per cent. on half a million is £10,000, is it not?

A.—Yes.

Q.—That would be Messrs. Meik and Buchanan's fee for designing and carrying out these storm water drains, but actually you say they had absolutely nothing whatever to do with that?

A.—I sent them the drawings that I had done, and they sent one letter, I think, with perhaps a hand sketch showing an alternative proposal.

Q.—Is that all they did?

A.—That is practically all the help I got from them.

Q.—We were told that the construction of the work and the designs were going on simultaneously throughout the contract. Is that true?

A.—Yes, substantially.

Q.—Did Meik and Buchanan have anyone in their employment and pay out there doing any of these designs?

A.—None.

Q.—None at all?

A.—No one.

Q.—It was left for the Government of Bombay to pay for the designing of the work?

A.—Practically.

Q.—When did you begin your project estimate?

A.—As soon as I got out.

Mr. Billimoria.—In June, 1920?

A.—No, I left London on the 19th November, and I went all the way round by sea, as I wanted a little rest.

Sir Frederick Hopkinson.—So you would get there about the end of the first week in December?

Mr. Billimoria.—December, 1920?

A.—Yes.

Sir Frederick Hopkinson.—Did you start your project estimate at once?

A.—Well, no, we were not in a state to do it at once. We had to look round and make many preliminary investigations. I was working on that in 1921.

Q.—Can you tell me when you started it?

A.—I could not tell you the exact date.

Q.—Approximately. I do not want to pin you to a day or a month. Was it in 1921?

A.—Yes.

Q.—Roughly when—the middle of 1921 or the end of 1921?

A.—The usual process of Government work is that no expense can be incurred until the estimate has received the sanction of the appropriate authority.

Q.—Although you knew you had been spending a lot of money in London for plant?

A.—Yes, we were told to get on. As there were preliminary things we had to do we knew roughly before we had our estimates we had to incur a certain amount of expenditure, and in order to get the objections to that expenditure raised we made out detailed estimates as fast as we could, and those detailed estimates were sent in.

Q.—For things you were going to do at once?
A.—Yes.

Q.—That is to say, before you went about the business of laying out a quarry, you would have to have a particular estimate for doing it?
A.—Yes. We did not have an approved estimate. We made out our scheme and decided on what we were going to do, and set to work and then made out our estimates.

Q.—When did you begin to make this project estimate?
A.—You can say it was in the beginning of 1921—details of it. Parts of it were done then.

Q.—You began it in the beginning of 1921?
A.—Yes.

Q.—When did you finish?
A.—It was finally finished in May, 1922, I think.

Sir M. Visvesvaraya.—The beginning or end of the month?
A.—The beginning of the month.

Sir Frederick Hopkinson.—So that altogether you were about 15 months over making it, from start to finish?
A.—Yes; and in doing many other things besides.

Q.—It is a very detailed document, and in order to make it you would require pretty complete plans of all the work you were going to do, would you not?
A.—Yes.

Q.—You must have, or else you could not have got out those quantities?
A.—Yes.

Q.—This project estimate extends to 17 pages and represents a very large amount of work?
A.—Yes.

Q.—And a large amount of work that could not be done by your assistant, but had to be done by yourself?
A.—I did a great deal of work on that.

Q.—You had to do the major part of this?
A.—A very great deal.

Q.—If you were on that scheme from early in 1921 to May, 1922, it did not leave you very much time for carrying on the work. It must have hampered you very much?
A.—Certainly.

Q.—Probably you will agree with me that in starting a big work of this kind, opening up quarries and getting everything ready for your dredger, getting your roads ready, ordering your plant, and so on, it takes pretty well the whole time of a competent man?
A.—Yes.

Q.—Therefore, if your attention was diverted from this necessary work to spending 15 months over an estimate, the work would correspondingly suffer?
A.—Well, one could work overtime We were generally doing overtime.

Sir M. Visvesvaraya.—You had the requisite staff?
A.—Well.

Sir Frederick Hopkinson.—I am suggesting that the staff could not do it. This is the work of the individual who was in charge of it. They could do the quantities.
A.—A good deal of the donkey work was done by the staff.

Sir Frederick Hopkinson.—It would take a large proportion of your time?
A.—Yes; a certain proportion.

Mr. Billimoria.—That was necessary to be done—the estimate was necessary?
A.—Yes; the estimate had to be done in order to remove the audit objections, and things like that.

Q —Apart from the audit objections, for the scheme itself it was necessary?
A.—Yes; we could not go and work in the air.

Sir Frederick Hopkinson.—Did Sir George Buchanan visit the works every year?
A.—Yes; while I was there.

Q.—More than once a year?
A.—In 1923 I think he came twice.

Q.—Was there any special reason for that visit? Was it to see the effects of the monsoon?

A.—Yes; I think that was the purpose.

Q.—Not to see the work being carried out, because the work would be largely stopped?

A.—Of course it was largely stopped at that time.

Q.—How long did Sir George Buchanan stay when he was out there each year?

A.—Well, I have not got the dates. I think the dates of his visits are in the special reports that he gave for each year.

Q.—Did he give the dates?

A.—I think so. I have got an idea that he did.

Chairman.—Sir Lawless Hepper did not give the dates in the Directorate reports.

Sir Frederick Hopkinson.—He said in Sir George Buchanan's reports.

A.—Sir Lawless Hepper sent me some papers. He wrote and told me that I was probably going to be asked to appear before you, and he sent me a certain number of papers to refresh my memory, and among those papers was a printed document.

Q.—Is that it? (*Document handed.*)

A.—Yes; I think he generally opened out by saying that he arrived on such-and-such a day, and the reports were generally put in before his departure.

Q.—Sir George Buchanan says in his report, dated the 11th of February, 1922: "I have now had the advantage of living for two months on the works at Colaba."

Chairman.—He left on the 25th February, 1922. There is no doubt about that date.

Sir Federick Hopkinson.—I do not remember his ever mentioning that he arrived or left on particular days. In 1922 he left on the 25th of February.

A.—When did he arrive then?

Q.—I cannot tell you. The next year he came out in July and left in August, but the works would then be practically stopped?

A.—There would not be much doing then.

Q.—He came out again on the 28th December, 1923, and left on the 20th January, 1924; and in 1924 he came out on the 24th November and left on the 16th February, 1924. In 1925 I have not got the date he arrived, but he left on the 7th January. When he was there did he spend the whole time at Bombay?

A.—He often had other things to do in other parts of India.

Q.—I was given some figures in Bombay which showed that he had been in Bombay an average of about five weeks in a year. Do you think that would fairly represent the time spent on the works?

A.—I should think it would not be far out.

Q.—When he left you had no means of communication with him except by cable or letter to London?

A.—No.

Q.—A letter would take probably five weeks to get an answer?

A.—Something of that nature.

Q.—When the dredger first came out in March, 1922, what was the programme for using it? We know it did not start work until December, 1923. Had you any programme sent out by Sir George Buchanan as to what the dredger was to do when it came?

A.—Well, we knew that it was impossible to use it at that time, and it had to be laid up.

Q.—Did he ever write to you to that effect? Did he give you a programme?

A.—There were many.

Q.—Did he give you a programme before March, 1922? Did he write and say: "Now the dredger is leaving England next week, and will be with you in about a couple of months, and it is to do such and such work"?

A.—No, I do not think so.

Q.—In April, 1921, Sir George Buchanan wrote to you: "My dear Lewis, There is no violent hurry as the earliest the dredger can start work will be at the end of 1922." You replied to that, I think, saying that nothing could be done before the end of 1923. How do you account for his not knowing within a year when the dredger could start? Can you account for it?

A.—No, I think it was being too optimisitic on his part.

Q.—Did not he have progress plans showing how the work was getting on?

A.—Yes, he was kept informed.

Q.—Was he kept fully advised?

A.—Yes.

Q.—Did he have periodical reports?
A.—Yes.

Q.—Is it possible that when he wrote that letter of the 14th April, 1921, he had not thought of the storm water drains?
A.—I could not say.

Q.—At any rate, the storm water drains were not built in April, 1921?
A.—No.

Q.—In fact, you were only just beginning to think of designing them towards the end of 1921?
A.—Yes, we were in the very early stages of 1921.

Q.—You did not design them until 1922?
A.—No.

Q.—Therefore, for the dredger to start work at the end of 1921, the storm water drains, or some of them, would have had to be completed?
A.—Yes.

Q.—Otherwise the dredger could not start. So it really comes to this. The two dredgers, the " Sir George Lloyd " and the " Colaba," were sent out to you without any programme as to when they were going to start, or what they were going to do? There is a letter from Messrs. Meik & Buchanan dated the 25th April, 1921, but that was a year before the dredger got there?
A.—Yes.

Sir Frederick Hopkinson.—That letter says that the dredger will begin work about December or January, 1922. I suppose that means December, 1921, or January, 1922.

Chairman.—It must have meant December, 1922, and January, 1923, because it fits in with the end of 1922. It must be December, 1922, and January, 1923.

Sir Frederick Hopkinson.—Yes, it is evidently a misprint here. December, 1922, or January, 1923—" or even later, if the wall in section 1 is not finished." Which is section 1?
A.—I think it is block 8. When I read some of these papers, I was under the impression that things had got shifted round.

Q.—It must be so, because here is area K, where the dredger is going to work?
A.—Yes.

Chairman.—We were told that plan has got a different numbering on it, and that when he spoke about section 1, it is block 8, the Military area?
A.—That is my idea of it.

Sir Frederick Hopkinson.—It must be so, because it is the nearest point to area K, where the dredger was going to work.
A.—I think those block numbers must have been put on after I left.

Chairman.—It is possible.
A.—They do not seem a bit familiar to me. In fact I do not understand a good deal of the context except on the supposition that they have been changed.

Sir Frederick Hopkinson.—There is one question I omitted to ask you. Did you ever see any estimate for putting in the five pipe-lines across the City of Bombay?
A.—No estimate.

Q.—No separate estimate?
A.—You mean from Messrs. Meik & Buchanan?

Q.—Yes.
A.—No.

Q.—Did you ever hear what they were going to cost?
A.—When I saw the idea of them I was very much afraid of them. What they would have cost I do not know; but I got Sir George Buchanan, one by one, to give up the idea.

Q.—Why?
A.—Well, because it meant such an enormous amount of work and trouble. One was coming right down *here* from Ormiston Road across the Cooperage, through these gymkhanas and out into Back Bay near the Back Bay Baths.

Q.—We want to get this certain. This is what Sir George Buchanan says in his original report: " From Mr. Kidd's plans I see he proposes seven pipe-lines across the Peninsula. I think this number is excessive, and have reduced the number to three." Where is the first one?
A.—Pipe-line No. 1 is through the British Infantry Barracks at Colaba.

Q.—Has that one been put in, or did you alter its position?
A.—That has been altered. It has been taken further south.

Q.—Why?
A.—Well, first of all to get clear of the Barracks; and I think I am right in saying that we had a better place to take off. We had to build out a bank to carry the pipes.

Q.—Was it more convenient and economical to avoid going underneath the Barracks?
A.—Yes.

Q.—Much?
A.—We had a shorter line.

Q.—Do you mind answering my question? It was more convenient and economical?
A.—Yes.

Q.—Then No. 2?
A.—No. 2 is, approximately, where No. 2 is now, that is across the Colaba Road, at the very narrowest point of the Peninsula.

Q.—That is the one which, I think, is in use at present?
A.—Well, I do not know whether that is in use.

Mr. Elgee.—They have not used it yet.

Sir Frederick Hopkinson.—But it is in?
A.—It is in.

Q.—It is going to be used?
A.—It was in in 1924.

Q.—That is in Block 7. What about No. 3?
A.—No. 3 is down Ormiston Road and across the Cooperage, through the gymkhanas, out to a point near the Back Bay Baths.

Q.—A distance of what?
A.—It is about 2,500 feet.

Q.—That is half a mile?
A.—Yes.

Q.—What size of pipe is that?
A.—42-inch.

Chairman.—Taking the exterior measurement, it is more than 42 inches.

Sir Frederick Hopkinson.—Yes; but you always speak of a pipe by its internal diameter. It is a 42-inch pipe. Do you know the site of this Ormiston Road?
A.—Yes.

Q.—Is not it rather high?
A.—It is all on about a general level. There is not much difference of level there.

Q.—It has been described to us in Bombay as being the cost of a Tube railway.
A.—Well, it was very expensive. There is no doubt about that.

Q.—Did you ever make an estimate of what it would cost?
A.—No; the look of it was enough for me.

Q.—You thought it was quite impracticable?
A.—Yes.

Q.—At any reasonable cost?
A.—Yes.

Mr. Billimoria.—There are buildings all over that place. All those buildings would have to be demolished?
A.—No, you could go down the centre of the road.

Sir Frederick Hopkinson.—It is like taking a main sewer down the street, and then ultimately it would have to be taken out again.

Chairman.—What about the bends?
A.—That would have been easily arranged.

Sir Frederick Hopkinson.—It was a fairly straight road?
A.—Yes, there is one bend in it. So far as I remember, it is just about the Taj. The Ormiston Road runs along the Taj Mahal. It is just up there.

Q.—There are tramlines close to there?
A.—We would have to cross the trams. It was going across the whole of Bombay.

Sir Frederick Hopkinson.—It would be the whole width of Bombay. You agree it was quite a considerable distance?
A.—Yes.

Q.—So that if that was included in the original estimate, and has not now been done, it ought to represent quite a considerable saving?
A.—Yes.

Q.—Have you any idea of how much?

A.—I could not say. You see there would have been such a lot of special work there.

Q.—It is 2,500 feet. Can you give us any idea of what it was worth?

A.—No. We have got nothing like it in the contract. There was a short length in Pipe-line No. 2, which went across the road; and I really forget now what that cost. It was not much, but it was a very short piece.

Q.—Was it rock, in this Ormiston Road, or soft stuff?

A.—I could not say.

Q.—You could not give me any idea of the cost of this 2,500 feet of pipe?

A.—No.

Q.—Was not the reason for putting the pipe-line there in order to bring the site of reclamation within a certain limit of distance from the dredger?

A.—I do not know

Q.—In his original report he limits the distance to 10,000 feet, consequently, your pipes across Bombay must be so placed that this 10,000 feet would not be exceeded?

A.—Yes.

Q.—Therefore, if you did away with this pipe on account of its expense, you have got to use one a considerable distance off. What I mean is this. If your pipe is put in along Ormiston Road across Bombay, and has to fill the reclamation at the western end of block 1, and, therefore, if that is more than 5,000 feet, the pipes cannot efficiently do the work?

A.—No.

Q.—Therefore, if you do away with that pipe across Ormiston Road, and if you bring it back in the direction of the Gun Carriage Base, it would make the filling of these blocks impossible by the dredgers, because your distance would be so much greater?

A.—Yes.

Q.—Is that so?

A.—It would be very difficult, certainly.

Q.—It would make it very much longer?

A.—Yes.

(*Adjourned for a short time.*)

Sir Frederick Hopkinson.—Were you ever interested in a comparison of Sir George Buchanan's and Mr. Kidd's estimates for this work?

A.—No.

Q.—When you got back to Bombay at the end of 1920 you commenced shortly afterwards to make your project estimate?

A.—Yes.

Q.—When did you first come to any conclusion that the estimate of 367 lakhs was likely to be inadequate? Was it early? Was it before you went back to Bombay?

A.—No.

Q.—Had you considered it in 1920?

A.—No.

Q.—When did you first consider it?

A.—I do not know that I can state a date.

Q.—Approximately. Was it as soon as you began to work out any price at all?

A.—Well, I do not know when it was.

Q.—You must have seen, as you progressed with your estimate, that your prices were going to be entirely different from Sir George Buchanan's. Your estimate, eliminating the sale of plant at the end, was about 770 lakhs. Sir George Buchanan's was about 357. That is more than double. Would not you see at a glance almost that Sir George Buchanan's estimate——

A.—Yes. I was trying to fix in my own mind the date, but I do not think I can.

Q.—Cannot you give me any idea? Would not you see it at first almost? If it had been an ordinary difference of 10 or 15 per cent., I could have understood you not seeing it, but it is a difference of over 100 per cent.?

A.—Well, I did see it, of course, but when I saw it—what month—I could not say exactly or even approximately.

Q.—At any rate you did see very soon—you must have seen very soon—that your estimate was going to be much greater than Sir George Buchanan's?

A.—I realised that a long way back. I cannot fix a date now.

Q.—I do not want you to fix a date. I only want you to give me your impression as to whether it was soon after you began to make your estimate that you realised it?

A.—I am afraid I cannot give any date.

Q.—Would not the mere fact that you found the first price which you fixed for any portion of the work was double that of Sir George Buchanan's rather alarm you at once?

A.—We worked out detailed estimates of the things as they were wanted. It was the preliminary works really that came first. I think some time in 1921 I had come to the conclusion that it would exceed very considerably——

Sir M. Visvesvaraya.—Did Messrs. Meik & Buchanan invite your attention to the necessity of starting the preparation of estimates?

Sir Frederick Hopkinson.—Who asked you to make a project estimate?

Chairman.—Did anyone, or was it your own idea?

A.—It was a matter of necessity. It was known by everybody that a project estimate was necessary.

Sir M. Visvesvaraya.—It was known to everybody?

A.—Of course.

Chairman.—It was part of the necessary routine.

Sir Frederick Hopkinson.—It was part of the usual procedure of the Indian Government?

A.—Yes.

Sir M. Visvesvaraya.—I am afraid that this did not form part of the usual procedure of the Indian Government?

A.—It ought to have been done, of course. It ought to have been completed before sanction was given to the estimate, but I found the conditions reversed and that sanction had been given to an estimate which was obviously not in detail.

Sir M. Visvesvaraya.—When the scheme was sanctioned it was not recognised that it was incomplete. There is nothing stated in the correspondence that the 367 lakh estimate was incomplete?

A.—That could not be possibly a working estimate.

Sir Frederick Hopkinson.—It did not comply with the usual requirements of the Indian Government?

A.—No. It was considered more as an administrative sanction than anything else.

Sir M. Visvesvaraya.—Where is any such statement made in submitting the estimate to the Government of India. You took the initiative in revising the estimate, I take it?

A.—I would not like to say that I personally took the initiative, but I recognised that it was a necessity, and I started in with the work.

Q.—You have no recollection that the engineers asked you to prepare the revised estimate?

A.—Sir George Buchanan realised himself that a revised estimate was required.

Q.—At what stage?

A.—He realised it during his visit in 1921-22. I had not got the data. He made one up himself.

Q.—That was in February, 1922?

A.—He made it up during his stay in Bombay.

Mr. Billimoria.—What necessitated the revision of the estimate?

A.—It was not a revision of the estimate. That is a wrong term really.

Sir M. Visvesvaraya.—When you prepare a new estimate for 702 lakhs and the original is 367, what do you mean by saying that it is not a revision?

A.—I never took the original estimate of Sir George Buchanan as a working estimate for the work.

Q.—You may not have done so, but there is nothing on record to show that it was so taken at the beginning. Can you point to anything in the correspondence?

A.—No, I cannot remember all the correspondence.

Mr. Billimoria.—It is called the " revised estimate," if you look at the printed records?

A.—It was a project estimate which we always knew it as.

Sir Frederick Hopkinson.—It is headed " project estimate."

Mr. Billimoria.—I mean the small blue book which Sir George Buchanan signed. It is called the revised estimate there.

Sir Frederick Hopkinson.—I want to see that book, because I believe on that estimate Sir George Buchanan suddenly put a lump sum of £750,000.

Mr. Billimoria.—That is it. You will find " revised estimate " on the top of it.

Chairman.—May I interpose for a moment to call attention to the statement of the 11th February, 1922? We ought to have that now. It is on the second page of Sir George Buchanan's report of the 11th February, 1922. " Under the rules of the Government of India for the carrying out of public works, the approval of my report,

plans and estimates, did not imply more than accordance with administrative sanction to the scheme, and a detailed project estimate giving the fullest particulars under each head and every head should have been submitted before any actual expenditure was incurred. The preparation of this estimate would have taken a staff of engineers at least one year, and when completed would have been valueless for the same reasons that contractors were unable to submit a firm tender, and as time was of importance it was decided to proceed in anticipation of sanction and to prepare the detailed project estimate as soon as reliable data had been collected." Does that accord with your recollection of the matter?

A.—Yes.

Sir Frederick Hopkinson.—Do you know what he means by " reliable data "? Does that mean to throw doubts upon the data given by Mr. Kidd?

A.—I do not know.

Q.—It may have been his own data. Do you know how long a Government would have given a contractor to make up an estimate for work of that kind? Do you think they would have given them more than a month?

A.—I do not know really. I am afraid that is outside my experience.

Q.—Did you ever give a contractor a year to make up an estimate?

A.—I always made up estimates myself.

Q.—Supposing you were letting work by tender, how long would you give a contractor to make it up?

A.—It is usual for the engineer to prepare a schedule, is it not?

Q.—Never mind that. How long would you have given a contractor to have made up an estimate? The engineer gives him a schedule of quantities, and the contractor has to fill in the prices. How long do you think he would be given in ordinary circumstances? I suggest to you not more than a month, or at the outside six weeks. Is that about right, do you think?

A.—I should think so.

Q.—Therefore can you tell me why he should require a year?

A.—You must ask Sir George Buchanan that. It is not a statement of mine. I am not responsible for what Sir George put down there.

Q.—Do you think it is possible that this very low estimate of 367 lakhs was given for the purpose of getting administrative sanction?

A.—I do not know. That was months before I ever knew of the job.

Q.—You have seen this estimate which Sir George Buchanan calls his revised estimate, 1922?

A.—Yes.

Q.—That amounts to 668 lakhs or net 599 lakhs. We have been told that towards the end of making up this estimate Sir George Buchanan suddenly put on a crore of rupees, or £750,000, and they could not tell whether it had been put on the prices or put in in a lump sum. You notice even on this estimate of 1922 he is still 100 lakhs below your estimate?

A.—Yes. Sir George Buchanan made this estimate. I had not full data to give him; I had not them myself, and he might have left the matter to me. It was really my business. According to Indian ideas it was my business to have done the thing, and I had it in hand. I had promised the Government to have it ready by about the end of March. We may have been a little later than that, but I was working on it. I had not got the full data. I was not able to give all the data to Sir George at that time. Nevertheless, he made up this estimate knowing that mine was under way and that it was going to be handed in in a few months.

Q.—Is this Sir George Buchanan's estimate, or is it your estimate?

A.—I had nothing to do with this (Sir George Buchanan's estimate).

Q.—But I rather gathered from what you said a moment ago ——

A.—He asked me sometimes for information and things like that, but I had not got the data all collected together.

Q.—But you evidently gave him some prices?

A.—I gave him certain prices.

Q.—To make up this estimate?

A.—And he made it up on that, yes.

Q.—Then a few weeks afterwards you finished your estimate. I think it was finished in May, 1922?

A.—About then.

Q.—Which amounted to 770 lakhs?

A.—Yes.

Q.—As against his 669?

A.—I do not remember having seen *this* estimate at the time.

Q.—Had he sufficient information other than he had got from you to be able to say that the Kandivli quarry land acquisition was going to cost 20·13 lakhs? Just compare it with some of your figures.

A.—That is lumping the whole lot together.

Q.—It is obvious that you supplied these figures, because take the Gantry, for instance. You say it is 13·68 lakhs 481 rupees and he calls it 13·69 lakhs. Yours is in greater detail than his, and it is difficult to compare them?

A.—He has lumped up a lot of things.

Q.—Which you put in in detail?

A.—Yes.

Sir M. Visvesvaraya.—You seem to have supplied to him some material for his estimate?

A.—Yes. He asked me for certain information, and what I had I gave to him, as far as I remember.

Sir Frederick Hopkinson.—It is very difficult to compare these things. Your Establishment and Consultant Fees come to 66 lakhs. He has got 25. That is an enormous difference to be made out at the same time, is it not?

A.—What is the rate in my estimate for that? Is it 7½ per cent.?

Q.—It does not give it. Then " Unforeseen Charges " you put at 10 lakhs and he puts them at 25. Therefore, although it may be based on yours, he does not take your figures throughout—or probably you had not got to the stage in February of putting those things on?

A.—No, I had not. I had not got anywhere near complete.

Q.—Is it not possible that he has just lumped them together at the end?

A.—I do not know.

Q.—Did you give him a lot of information out there to enable him to find out these detailed prices?

A.—I gave him any information I had.

Sir Frederick Hopkinson.—Did you give him a large mass of detailed information to enable him to arrive at these figures? When you finished your estimate in May, 1922, did you communicate the total to Sir Lawless Hepper?

A.—I handed the estimate to him—or sent it down.

Q.—Was anything said about the difference between the two estimates?

A.—I think Sir Lawless Hepper was prepared for it.

Q.—Then he did not stagger under the blow?

A.—No.

Chairman.—He says that he knew at the time when Sir George Buchanan was handing in the estimate of February, 1922, that Mr. Lewis's estimate was going to be in the neighbourhood of seven crores of rupees. That is on Page 44 of the evidence.

Sir Frederick Hopkinson.—So that in February, 1922, you must have practically completed your estimates. You knew what the total was going to be and you could not know that unless it had been practically completed.

Chairman.—At that time, says Sir Lawless Hepper (that is February), " The sanction project estimate of 702 lakhs was approaching completion, and of course I discussed it on numerous occasions with the chief engineer, and I knew it was going to be in the neighbourhood of seven crores." That is right. Let us get along.

Sir Frederick Hopkinson.—Did you have anything to do with inviting tenders for the wall at the East Colaba end—the first 8,000 feet?

A.—Not beyond getting the specifications printed.

Q.—Then you had something to do with it?

A.—That was all.

Q.—That specification called for a wall built of concrete blocks, nine or ten tons, were they not?

A.—Yes.

Q.—Faced with coursed masonry?

A.—I think that was it.

Q.—In order to do that would it not have been necessary for the contractor to have first of all opened up a quarry?

A.—Yes.

Q.—To have laid roads into the quarry?

A.—Yes.

Q.—To have got plant for taking his stone down to the site?
A.—Yes.

Q.—To have laid a railway line from Marine Lines to Colaba—four miles?
A.—He would have to get it down there; he would have to transport his stuff.

Q.—To have made a concrete block yard for building his blocks?
A.—Yes.

Q.—To have provided a 10-ton crane for handling them; to have provided roads from the block yard to the wall for setting them. You agree with all this—please say so?
A.—Yes.

Q.—To have provided a 10-ton crane for the purpose of setting them?
A.—Yes.

Q.—To have made special arrangements for stone crushers for crushing his stone?
A.—Yes.

Q.—To have made special arrangements for the supply of sand. All of these things were ultimately required for the extension of that wall beyond 8,000 feet, were they not?
A.—The work would have been carried on from the northern end down to 8,000 feet.

Q.—And beyond 8,000 feet. I think this wall was carried on to 11,800 feet?
A.—No, 8,000 feet was then contemplated.

Q.—This opening of the quarry and the laying of the railway to Colaba were all required for the general construction of the work, were they not—the provision of plant, locomotives and trucks, and therefore the whole cost of this would have had to have been spread over 8,000 feet of wall only; whereas if it had been done in the bulk, that is to say, if it had been done as part of the general scheme, a large proportion of that cost would have been spread over the general scheme?
A.—Yes.

Q.—Consequently it was hopeless to expect to get a reasonably low price for the carrying out of that work. It could have been done very much cheaper as a part of the general scheme?
A.—Yes.

Q.—Consequently it was not a proper attempt to get tenders. They could not possibly be acceptable because of their high cost. You must see that?
A.—Yes.

Chairman.—You see what Sir Frederick means—that there was no reasonable likelihood, having regard to the immense amount of plant which the contractor had to get round him to do this work, that the estimate would be a reasonably moderate one. It follows, does it not?
A.—Yes.

Sir Frederick Hopkinson.—Now I should like to come to the dredging. Did you ever go into the question of the sufficiency of the pipe line sent out originally to complete the works?
A.—Yes.

Q.—What did you find?
A.—I found there was not sufficient.

Q.—To what extent?
A.—That is in the correspondence.

Q.—Approximately I put it to you that the original supply of piping was just about half what was ultimately required?
A.—There is a long letter on the subject.

Q.—I will give you the exact figures directly, but that is approximately the position, is it not?
A.—Well, I cannot remember these things. Anyway, it was perfectly clear when we went into it that there was not enough.

Q.—Before the dredger came out, how was it understood that the " Sir George Lloyd " and the " Colaba " were to work? Were they worked together as one unit?
A.—They were to work in series, yes.

Q.—In one unit; that is the " Sir George Lloyd " would do the dredging and pump to the " Colaba," and the " Colaba " would pump to the reclamation?
A.—Yes, where the length of pipe line exceeded the power of the " Sir George Lloyd."

Q.—That was generally the case, was it not?
A.—In most cases.

Q.—Had you anything to do with the purchase of the " Kalu "?
A.—No.

Q.—Do you know what it was bought for?
A.—No, I do not know.

Q.—It was bought in 1919?
A.—It was bought before I came on the job.

Q.—Where was the " Kalu " when you first went out?
A.—She was lying up the harbour.

Q.—Did you take charge of her as part of your plant?
A.—The Port Trust were looking after her at first, and Mr. McMurray, the mechanical engineer of the Port Trust, was looking after her. That arrangement had been made before.

Q.—She was lying up, in other words, under the care of the Port Trust?
A.—Yes.

Q.—When did you actively take her over to your charge?
A.—I really cannot remember.

Q.—Did you ever take her over?
A.—Oh yes.

Q.—When did she first work for you?
A.—She never worked for me at all.

Q.—Then what did you do in the way of taking her over? Did you assume responsibility and put a watchman on board, or something?
A.—I forget now when that was done, but she had to be overhauled. That was done in my time.

Q.—As a matter of fact she did not work until about——
A.—I do not know when she worked.

Q.—After you left?
A.—After I left.

Q.—You left in July, 1924?
A.—Yes.

Q.—She had been bought in November, 1919. Therefore she had been lying idle for nearly five years?
A.—Yes.

Q.—Let us follow the " Kalu " up a little bit. She was bought for £75,000 in in November, 1919. She did nothing for five years. Five years at 6¼ per cent. per annum is nearly a third, so that brings her up to £100,000, or nearly £25,000 loss of interest. That is right, is it not?
A.—Yes.

Q.—Then she was overhauled, and that cost about £25,000?
A.—Yes.

Q.—So that the cost of the dredger by the time she did any work at all was roughly £125,000, and you do not know what she was bought to do. We know that the " Sir George Lloyd " and the " Colaba " were bought to do the total work, which was 25 million yards at five millions a year?
A.—Yes.

Q.—So there was no room for the " Kalu " had the " Sir George Lloyd " and the " Colaba " carried out their programme. Therefore, so far we do not know why the " Kalu " was ever bought. You do not know?
A.—No. That occurred before my time.

Q.—But she was under your care for nearly five years?
A.—Yes.

Q.—You would, of course, take a certain amount of interest in it as you were responsible for it. There was no area ready for the " Sir George Lloyd " to pump into until December, 1923?
A.—That was about it.

Q.—Although the dredger had been delivered in March, 1922. Therefore the loss of interest at that time was pretty considerable. If you take the cost of that, and the pipe line as something like £700,000, it is about £44,000 a year interest. Now, you can tell me something about this. The original intention, was it not, was to do the whole of the dredging from the harbour?
A.—Yes.

Q.—Why was that ever changed?
A.—You mean——

Q.—Why did you ever think of Back Bay as a dredging ground?
A.—As a possible dredging ground? I thought of that because it appeared to me possible that we should get better material from the one place than the other.

Q.—But you did not know what the material was like in the harbour?

A.—I had had a good many conversations with Mr. Mitchell, who was in Bombay and had investigated material obtained from the bed of the harbour.

Q.—I thought he was a chemist, was he not?

A.—Yes, but he had been examining the material in the harbour, I think for the Port Trust, as far as I remember, and I recollect he talked to me about it and expressed the opinion that it would not be good material for filling.

Q.—In what sense not good—too hard, or too soft?

A.—He said he thought it would take a very long time to dry out.

Q.—Therefore he thought it was too soft?

A.—Well, he said there were salts in it which would always attract water.

Q.—Always what?

A.—Always take up water, and he thought it would take a very long time to dry out. Then I knew that there was a great deal of mud, from the sections.

Q.—You would know that from the borings?

A.—Yes.

Q.—By the by, did you ever plot those borings?

A.—Yes.

Q.—Where are they?

A.—I do not know. I left them in Bombay.

Q.—We were told in Bombay that there were no sections of the borings.

A.—Of Mr. Kidd's borings? Yes, they were all plotted on sheets.

Q.—I asked for them, and I could not find them and I had some plotted specially for my own information.

A.—I had them plotted right the way up.

Q.—The whole lot?

A.—The whole lot—anyway, all that could possibly be of any use to us.

Q.—We have not got it very clearly yet as to why you ever thought of leaving the harbour for Back Bay as a site for dredging. In reading through Sir George Buchanan's report you will notice that he agreed with Mr. Kidd that it was not worth while going to Back Bay. There were too many rocks, and it was too dangerous, and there was no supply of material. That is one thing upon which Mr. Kidd and Sir George Buchanan evidently thoroughly agreed?

A.—I did not see that that had been proved, and I wanted to have it proved.

Q.—But why were you dissatisfied with the source of supply?

A.—Of course, these sort of things come on one gradually, it is not at a stroke; the thing grows, and I think it was mainly on account of the disproportionate amount of mud as compared with clay in the section.

Q.—That was all known before Sir George Buchanan wrote his report. You had no additional information of any kind. It was all based on Mr. Kidd's borings and soundings?

A.—Well, that, I think, was what brought me to wonder whether we could not get the material elsewhere.

Q.—Here was a scheme whose heart was the dredging of 25 million cubic yards of material from one place and putting it in another. You suddenly throw this scheme absolutely overboard—a scheme for which expenditure had been incurred to the amount of very nearly £1,000,000. There must have been some very strong reason indeed to have induced you to do a thing of that kind?

A.—I did not throw it over entirely.

Q.—You did not?

A.—Oh, no. I wanted to find out whether there was any other source of supply.

Q.—Why should you want another source of supply?

A.—Because, from the sections, I had misgivings as to whether there would be the quantity of suitable stuff.

Q.—Of clay?

A.—Of clay.

Q.—But we know from the figures on that plan—which I believe came from Sir George Buchanan—that the material at the southern end was almost entirely mud; and that is where the dredger started work. It was mud so thin that it poured away from the reclamation wall.

A.—What we got at first was very good.

Q.—That is one of the puzzles I cannot understand?

A.—It was a puzzle to me. When the dredger was started and we went to see what had come out (and the pumping was stopped to enable us to look at it) I was very agreeably surprised indeed.

Q.—You would be astonished because, according to the borings, there was no clay there for the dredger to work in?

A.—I was very much astonished and very agreeably surprised. I thought that had carried us over a difficulty which I had feared.

Q.—On 21st February, 1923, is it a fact that you had not got the necessary spares for working the dredger? Were you not at that time sending home a long list of necessary spares to enable the dredgers to work?

A.—They were spares we wanted to have. When the order was given the question of spares came up and, as far as I remember (it is in the correspondence), the question of spares was deferred because prices were extremely high then.

Q.—You mean in 1922?

A.—No, in 1920. The question of the spares was deferred. Then when Mr. Spiers came out I went into the question with him, and I think I went into it with Mr. McMurray also.

Q.—Prices all fell in 1922, did they not? They fell to lower than the 1919 level?

A.—Yes.

Q.—Then why did you wait until February, 1923, because, as I read this, your dredgers could not have worked without these spares?

A.—Yes, they could have worked. They were extra spares.

Q.—There is a spare pump shaft. Had not you got one?

A.—I really cannot remember.

Q.—It would not be safe to work a dredger like that without a spare pump shaft, would it?

A.—No, it was a thing which was required.

Q.—You might break down the next day and be stopped for three or four or six months possibly. Therefore, I say they were essential spares?

A.—Yes.

Q.—And you were writing for them in February, 1923?

A.—Yes.

Q.—Whereas the dredger was to have started in December, 1922?

A.—Well, there is a difference about that.

Q.—You were also at the same time writing for 1,000 feet of 42-inch floating pipe line and 1,000 feet of pipe line in 50-feet lengths—that is, 2,000 feet. This, mind you, was nearly a year before you started dredging?

A.—Yes.

Q.—I suggest to you that at that time, February, 1923, you had no programme of any kind whatever for working the dredgers. The Chairman calls my attention to a memorandum of a meeting in your office of the 14th December, between you, Sir George Buchanan and Mr. Halcrow, and it says here : " The general question of dredging was discussed. It was agreed that if sufficient first-class material could be obtained from Back Bay without undue risk to pipe lines and dredgers it would be better to use it rather than the mud and clay from the harbour. There was, however, no indication at present that large quantities could be obtained from Back Bay, and therefore plans must be proceeded with to use harbour material."

A.—What date was that?

Q.—That was the 14th December, 1922. Right up to the middle of 1924 you had no dredging programme whatever. I will give you details of it directly. I find you were making borings in April, 1923?

A.—Those were completed in the spring of 1923—the borings.

Q.—On the 22nd May, 1921, page 9, you will see that in a letter from you to Meik & Buchanan you said : "I do not think that the dredger will pump an ounce of material into the reclamation before the cold weather of 1923/24." Then on page 12 you will notice that in the second paragraph Sir George Buchanan was not prepared to accept Mr. Mitchell's chemical information about the material, " as we hope there will be a great deal of hard clay that will require very little moorum topping." Then in paragraph headed " (d) Reclamation at Colaba end " he says, " We do very strongly feel that on every ground an attempt should be made to use the new dredger for reclamation purposes "—(the new dredger presumably means the " Sir George Lloyd ") —" even for a month in 1922/23. Sir Lawless Hepper was appalled when I suggested before I left Bombay that we might not require a dredger until 1923/24. However, that, again, is a matter which you and I can thrash out on the spot." What do you think he meant by " even for a month "? You said just now that you thought it would be a very unwise thing to do because of the expense incident to getting the dredger there, and getting her moorings out, and getting the crew and working for a month. Why should he wish to work it for a month?

A.—I do not know.

Q.—Was it for the purpose of a display, do you think?
A.—I do not know.

Q.—At any rate, you agree it was not practicable business?
A.—Yes. You see that in what I wrote.

Q.—It has always been understood that the " Sir George Lloyd " and the " Colaba " were designed to work together as one unit. Suddenly, on page 13, we get a letter from Meik & Buchanan dated 14th June, 1921. There is a sudden interposition of the " Kalu."
A.—I never understood that.

Q.—He says, " We wish the actual dredging to be done, if possible, by the ' Sir George Lloyd.' " Why should he say " if possible "? Was not the dredger designed to do that work and nothing else?
A.—I do not know what he meant there.

Q.—Had it ever been mentioned to you before that he was going to have a third dredger working to make up the one unit?
A.—No. That was a complete surprise to me, and I never really understood how it was going to work.

Q.—Did that originate with Sir George Buchanan?
A.—Yes. That originated at the London end.

Q.—He says at the very top of the page, " We have discussed—— "
A.—That is Messrs. Simons.

Q.—I know. We have had the pleasure of meeting the gentleman—" the question of utilising the dredger ' Kalu ' to obtain additional pumping power, and he and we are of the opinion that the best method of carrying out the work will be to employ the ' Sir George Lloyd ' to do the actual dredging work and use the dredger ' Kalu ' in the pipe line between the ' Sir George Lloyd ' and the auxiliary pumping plant ' Colaba.' " Why should that be necessary.
A.—I suppose that was to get the necessary power in cases where long lengths of pipe were required——

Q.—But there was no alteration from the conditions existing in 1919? The material was in the same place, and it had to be pumped to the same place?
A.—Yes. There was a proposal to go out further.

Q.—But not until after you had exhausted the material within the limits?
A.—Yes. I never understood how it was going to work.

Q.—I want to justify my statement just now that there was no real dredging programme. At this date it was proposed to use the "Sir George Lloyd," the " Colaba " and the " Kalu " as one series. At this time you had no anchor boats capable of lifting anchors, had you?
A.—Not in 1921, no.

Q.—I am speaking of 1922. This is a letter from Mr. O'Rorke dated 28th July, 1922 : " We have not got any anchor boat to work with the dredgers capable of lifting her anchors." Therefore, if you had desired to work the dredger you could not have handled the anchors?
A.—No.

Q.—If you look at page 65 you will find there is a letter from Sir George Buchanan saying, " Assuming that the dredger ' Sir George Lloyd ' commences to pump from the harbour to Colaba next November, Sir George wished, if possible, that the dredger ' Kalu ' should commence about the same time to pump from Back Bay to Marine Lines." This is something quite new, is it not? Was not the whole of the reclamation to be done by the " Sir George Lloyd " and the " Colaba "?
A.—Originally, yes.

Q.—This is something quite new before either dredger had commenced. Do you think it was because they had become tired of seeing the " Kalu " lying idle and that they thought they would like to find her a job? Apparently there was no reason for buying the " Kalu," because she did not enter into the scheme of things at all?
A.—She was there before.

Q.—Before any of the other dredgers were there?
A.—Yes.

Sir M. Visvesvaraya.—The " Kalu " was purchased for the East Colaba reclamation.

Sir Frederick Hopkinson.—But never required there.

Sir M. Visvesvaraya.—They wanted it for East Colaba reclamation first.

Sir Frederick Hopkinson.—She was bought before they got out the plans or anything about East Colaba.

Sir M. Visvesvaraya.—They seem to have transferred her to this work.

Sir Frederick Hopkinson.—What I am suggesting is that she was designed apparently to go on to this work in order to increase the expense only, because the other two dredgers were sufficient to do the work. The " Kalu " was to add another 50 per cent. to the cost.

Sir M. Visvesvaraya.—They did not know where to debit the cost of the " Kalu " probably.

Sir Frederick Hopkinson.—Sir George Buchanan says, " This was admitted, but Sir George said that Sir Lawless Hepper agreed with him."

Chairman.—You had better start earlier on. " Mr. Lewis said he thought it would be better to use both dredgers at Colaba as the land there was of more value to the Development Directorate."

Sir Frederick Hopkinson.—Whilst you are on that, I might say that, obviously, the proper place to begin the formation of the reclamation was at Colaba, for one reason if for no other that directly you got the Colaba end blockade finished, you would receive payment of 240 lakhs, which would cover your capital cost to a large extent?

A.—Yes.

Q.—And save interest. This was admitted, but Sir George said, " that Sir Lawless Hepper agreed with him that it would have considerable moral effect on the whole scheme to complete a section at Marine Lines as soon as possible." You know the circumstances well. You know Bombay. What is that going to have a moral effect on—who, or what? Is it going to have a moral effect on the dredger?

A.—I did not pay much attention to that.

Q.—It is quite clear from this meeting of the 14th December, 1922, that there was no programme at all. You will see that lower down. You agree with that, I presume?

A.—I think there was.

Q.—" Discussion then went on to working of dredgers in series, and it was agreed, if at all possible, this uneconomical method of working should be avoided." Does not that show you that there was no programme?

A.—That was the question of the " Kalu."

Q.—It shows there was no real programme. They did not know what they were going to do, or what it was proposed to do?

A.—Yes, I think we knew that.

Q.—But you did not know if the " Kalu " was going to work there. " The position and lengths of pipe line were gone into "—gone into, in December, 1922. Surely it was gone into in 1919 and settled? If you make up an estimate of that kind you know what you are going to do, broadly. " The position and lengths of pipe line were gone into, and Sir George suggested that some saving might be effected, and it would be more advantageous to put one pipe line across Colaba instead of two, in a position about midway between the present proposed position. These matters were to be further looked into." So really, at that time, you did not know where the pipe line was going to be, or which you were going to use. At this particular time we are speaking of, when the " Kalu " was going to produce a moral effect somewhere, her repairs had not been finished. Sir George Buchanan writes to you, the chief engineer, on page 66, and he reiterates what has been reiterated so many times—that the successful reclamation of the enclosed area by pumping material dredged from the sea bed is the crux of the whole scheme. He further says, " We were aware that you had been investigating the prospects of obtaining material from Back Bay itself, and we agreed that a portion of the area near Marine Lines might most usefully be so reclaimed but that your idea of reclaiming the whole area by dredging from Back Bay was a deviation from the original and sanctioned project which required very grave consideration, the responsibility resting with my firm." That is a suggestion of entirely abandoning the crux of the whole scheme, which was to remove material from the harbour to the reclamation; and that, mind you, is in December, 1922, the month in which Sir George Buchanan said the dredgers ought to start work. Is not that so?

A.—Yes. They could not possibly have started work in 1922.

Sir Frederick Hopkinson.—In paragraph 2 he says: " I remarked that, in my judgment, the first thing to do was to ascertain the precise nature of the material in the harbour by a practical test." This, again, was in December, 1922. He is thinking then that it is essential that the precise nature of the material should be discovered. After he had built a dredger to do the work—namely, by a grab dredger, the " Kalu," or by a bucket dredger borrowed from the Port Trust, and finally Mr. McMurray suggested that the new grab dredger being built for the Port Trust and expected out in a few months and which had to be tested somewhere, might be requisitioned for the work. So that apparently he was prepared to put off an opportunity of discovering the nature of the material until this unbuilt vessel arrived on the scene.

Chairman.—It says so in the next line, " It was then agreed to negotiate with the Port Trust for her use."

Mr. Billimoria.—That was based on the fears expressed by Mr. Lewis, if you read the first sentence of paragraph 2.

Sir Frederick Hopkinson.—Mr. Lewis and the chemist.

Mr. Billimoria.—Because there he says, " Your fears as to the suitability of the material in the harbour."

Chairman.—Then it is backed up, and Mr. McMurray observes that too much credence should not be given to borings, as from his experience at Sewri the borings were found to be unreliable.

Sir Frederick Hopkinson.—He says, " Your programme of work contemplates beginning dredging operations in the season 1924-25, and I emphasise the tremendous importance of starting before that date." Mind you, the scheme was to be completed in 1926, and he is saying here that it is tremendously important that you should begin in 1924-25. " It has certainly been our intention to lay the first pipe line across the peninsula at the earliest possible date and get the dredger to work. It was then agreed that the dredger must begin work not later than the end of the 1923 monsoon."

A.—That was when she did work.

Q.—That was when she did work. You turn out to be an accurate prophet. Originally the dredger was to have started in September, 1922. Then it was to begin in 1924-25. Then it was altered to begin in 1923-24. I want you now to turn to page 100. In a letter to the Director of Development from Messrs. Meik & Buchanan, dated the 3rd November, 1923, they say: " We have the honour to address you on the subject of the completion programme for the Back Bay scheme, as although it may not be possible at this stage rigidly to adhere to the programme, it appears to us that it will assist the administration to have before them even a tentative programme of operations." This is the 3rd November, 1923. So that apparently there was no tentative programme of operations at that time?

A.—Yes.

Q.—Why does Sir George Buchanan say: " It will assist the administration " if they had one?

A.—Well, I do not know. Really, you see——

Chairman.—Really what?

A.—I did not write this.

Sir Frederick Hopkinson.—But you received it?

A.—No; it was to the Director of Development.

Q.—It would be passed on to you?

A.—Well, we had so many programmes.

Q.—I want to refer to page 131, also. If you look at the bottom of that page you will see we have a new development, because in the last paragraph but one he says: " Regarding the booster sets, these have formed the subject of a telegram to you, the confirmation of which is sent herewith."

A.—That was after I left.

Q.—Then you cannot deal with that; but I would like to call your attention to the fact that a new element has come into the state of affairs here. There are two booster pumps spoken of here—not one, but two?

A.—Yes.

Q.—I would just like to run through the various programmes with you. The first is that the " Lloyd " and " Colaba " are to do the work alone from the harbour. Then the purchase of the " Kalu " was made. I have not the quantities, but do you happen to have them so as to know how long you took? Do you remember the quantities of the " Colaba " reclamation? However, that was never seriously undertaken, was it?

A.—No.

Q.—Mr. Elgee says, that it was not possible to fill blocks 1 and 2 from the area in the harbour.

A.—That is the northern end?

Q.—Yes.

A.—No; there would be very great difficulty.

Q.—He says it was impossible. Do you agree with that?

A.—Yes.

Q.—Is not that really what induced you to go to Back Bay?

A.—It may have had some influence.

Q.—Was not it the real reason why you went to Back Bay?

A.—It may have been one of the reasons.

Sir Frederick Hopkinson.—The scheme as designed in 1919: " had entirely broken down." This is the evidence which is given. Mr. Elgee says: " I think it would have been impossible to fill the northern end from anywhere else." That is, from the strips

at the southern end of the harbour. Then the evidence continues: " (Q.) Impossible with the dredgers at your command?—(A.) Yes; because it is very expensive to put pipe lines across the city. (Q.) Of course, it would be a harebrained scheme to run a pipe line across the centre of Bombay.—(A.) I think that was the reason. They wanted to obtain material for blocks 1 and 2 from the nearest end. (Q.) It was not possible to fill blocks 1 and 2 from the dredging area in the harbour?—(A.) That is so. (Q.) Therefore, the scheme as a scheme had absolutely broken down?—(A.) Yes. (Q.) This dredging in Back Bay is the only possible way of getting over something which they had not seen in 1919—(A.) That is so."

Chairman.—That is the point. The point is whether you can show us how it was possible with the dredger " Lloyd " and the booster " Colaba " to fill blocks 1 and 2. It is all a matter of measurement. The suggestion is that you at some time realised that, and that was one of the things which induced you to go into Back Bay if you could.

A.—It may have been one of the things.

Sir Frederick Hopkinson.—You said just now it was—not it may have been.

A.—It may have been.

Q.—You said it was one.

A.—Well?

Q.—I put it to you that it was the real reason?

A.—Well, I think it may have been one of them.

Mr. Billimoria.—What were the other reasons, if this was one reason?

Chairman.—The other, you told us, was the fear that you had that filling in from the harbour would not make a good reclamation?

A.—Yes.

Q.—May I suggest a third reason. The third reason, I suggest to you, was the fact that the Royal Indian Marine and the Port Trust had taken away 15,000,000 cubic yards of material that you regarded as suitable for dredging. That is another of the reasons, is it not?

A.—Yes, that is one of them.

Q.—Anyhow, those are three reasons, at all events, which led you to wish to find out what was in Back Bay?

A.—Yes.

Sir Frederick Hopkinson.—So that we come to this. The original programme was two dredgers working from the harbour That was supplemented by having the " Kalu " working with them, which was on the 25th April, 1921. The next step was to take the " Colaba " into Back Bay. Do you remember that?

A.—The " Colaba "?

Q.—Yes, the " Colaba " was to go into Back Bay?

A.—I think that was after my time. I do not remember it.

Q.—It is page 84. This is a letter from Meik and Buchanan. " A large quantity of suitable material in Back Bay appears to be more than 4,500 feet from the sea-wall, and we, therefore, suggest that the " Kalu " should pump through a shore-pipe line, varying in length as required, to the " Colaba," which, in its turn, would pump the material through 4,000 to 4,500 feet of floating-pipe line to the reclamation." That is dated the 23rd May, 1923, when you were in charge?

A.—Yes.

Q.—I think the " Lloyd " was going to work alone, was she not?

A.—She must have done. She could not have worked with the others.

Q.—What do you think of the idea of taking the " Colaba," a new ship costing nearly a quarter of a million, into Back Bay, where she could not float at low water?

A.—Well, the " Kalu " would have had to dredge a place for her.

Chairman.—The next line says that: " In order to give flotation to the " Colaba " at all states of the tide the " Kalu " will have to cut her way in depositing the dredgings in a position to be selected."

Sir Frederick Hopkinson.—Even supposing that the " Kalu " had dredged this berth, would you think it a wise thing to take a new pumping dredger costing nearly a quarter of a million into an exposed place like Back Bay—shallow and rocky as we know it has been described over and over again. In fact, as you know, the whole place was condemned by Sir George Buchanan in 1919 as a possible place for dredging material. Would you think it a wise thing to take this new ship, the " Colaba," there, because, if anything happened to the " Colaba " the whole scheme is stopped?

A.—Yes, but that was never done.

Q.—I agree, but it was proposed to be done?

A.—Well, that was a proposal of Messrs. Meik and Buchanan.

Q.—I am asking you if you think it a wise and prudent thing to dream of doing? If anything happened to the " Colaba " I would like to remind you that you are risking the crux of the whole scheme?

A.—It was not my proposal.

Q.—I know that, but I am asking you if you think it a wise and prudent thing to do?

A.—I do not think it is a thing I should have done myself.

Q.—If you will turn to page 114 I want to call your attention to the requisition for more pipes. This is from the Development Directorate to Messrs. Meik and Buchanan, dated 2nd May, 1924. This is after the " Lloyd " had been working six months practically. You are asking there for an enormous length of pipe in order to carry out one of these various programmes. At this time you had got 18,422 feet of pipe and were asking for another 1,000 feet floating pipe line for next season. The original programme would be roughly 10,000 feet, but actually by this time you had got 18,000 feet. Is not that so?

A.—I do not follow that last part.

Q.—The original programme called for pumping through 10,000 feet of pipe line?
A.—Yes.

Chairman.—Will you look at the top of page 114.

Sir Frederick Hopkinson.—On the 2nd May, 1924, you had 9,630 feet in stock, but you wanted 15,000 feet. Therefore, you wanted 5,370 feet extra. That is floating pipe line alone.

Mr. Billimoria.—The shore pipe line is 20,400 feet total requirements, and they have in hand 5,820.

Sir Frederick Hopkinson.—So that you are asking for 19,950 feet extra. That makes a total of 35,000 feet roughly. That is partly due to your starting dredging in another place?

A.—Yes.

Q.—But 35,000 as against 10,000 is 3½ times as much?
A.—Yes.

Q.—It cannot be consequent upon that because these boats can only pump 5,000 feet?

A.—The amount of pipe originally allowed for was insufficient to cover the area that was laid down.

Sir Frederick Hopkinson.—It was very largely deficient.

Chairman.—But it was up to the limit of the pumping capacity of the two vessels?
A.—Yes, it was.

Sir Frederick Hopkinson.—Yet they wanted 3½ times the original pipe supplied and this pipe is not little stuff that can be bought for a few pence per foot?

A.—Quite so.

Q.—It is no wonder that the estimate has gone up.
A.—No.

Q.—On this very date, the 2nd May, 1924, they began to talk about another independent pumping station, which was to be done by buying the " Jinga " and making a barge with square ends large enough to take machinery, bunkers and accommodation for staff and crew. " It is considered by this means an independent pumping station could be most cheaply obtained." That is another alteration?

A.—Yes.

Q.—The purchase of the " Jinga " was suggested on the 2nd May, 1924?
A.—Yes.

Q.—What was the " Jinga " to do?
A.—She was to be a second booster.

Q.—Working on which line?
A.—I have forgotten now the exact line; but it was all worked out on the plans.

Q.—It was?
A.—Yes.

Q.—I used to think in Bombay that the " Jinga " was an imaginary ship, because I could never find out what she had done, or where she was, or what she was going to do; and she has done nothing yet?

A.—I do not know.

Q.—We saw her having a new pump put in her.
A.—I do not know anything about it.

Chairman.—In August, 1926, she was still in dry dock in a state of dishevelment.

Sir Frederick Hopkinson.—Unpreparedness, we will say.

Chairman—She was very dishevelled.

Sir Frederick Hopkinson.—Did the " Kalu " work in Back Bay in your time, or was it afterwards?

A.—No.

Sir Frederick Hopkinson.—Do you remember Sir George Buchanan writing and suggesting that she should do this, and saying that from the information he had obtained she had done the same sort of thing for the Sewri reclamation in two or three days?

Chairman.—She had dredged flotation for herself in two or three days?

A.—I think I remember that.

Sir Frederick Hopkinson.—Would you be surprised to learn that she took a whole season to do it in Back Bay?

A.—I heard that, too, I think I was told that yesterday.

Q.—She did 15,340 cubic yards in her whole season which, at her contract rate, is something less than eight hours' work?

A.—Yes.

Chairman.—We must now interpose another witness, Colonel Paddon.

Lieut.-Colonel S. S. W. Paddon was called and re-examined.

Sir Frederick Hopkinson.—Have you any figures we can ask you about?

A.—Yes, I had better give you a copy of these figures, and I will explain them. (*Document handed in.*)

Chairman.—I will ask Sir Frederick Hopkinson to take you over these figures.

A.—Yes.

Sir Frederick Hopkinson.—Do you produce some comparative prices of material for the years 1912 and 1919?

A.—Yes.

Q.—Are those prices that you are personally familiar with, and which have come under your cognisance?

A.—Yes, some; and I have put in the remarks column where I obtained them. About half of them are from my own contracts, and the others I got from various reliable sources.

Q.—Do you give pig-iron? I do not see that?

A.—No.

Q.—That is unfortunate, because pig-iron is the basis of all metal prices.

A.—I have a figure for pig-iron which would probably be considered reliable. It is in the chart prepared by Richards & Sons.

Q.—Can you give us the price of pig-iron in 1912?

A.—This only goes back to January, 1914.

Q.—What was it then?

A.—It was £2 10*s.* a ton.

Q.—That will not help me very much, because we want to compare 1912 to 1919?

A.—Well, most of the figures do not show a great variation between 1912 and 1914.

Q.—I am afraid mine do, because I have got a price of 49*s.* 6*d.* for 1912 for pig-iron.

A.—I am afraid I cannot help you, then.

Q.—Can you give me the prices for 1919?

A.—January, March, June and August it is a flat rate right through of £6, or just over £6. No, I beg your pardon, I am wrong. Pig-iron No. 3 G.M.B. In the beginning of 1919 it was under £5 and remains constant until the end of March, 1919; and then there is a sharp rise.

Q.—What does it go to in September?

A.—This graph only goes to August; but at the end of August it was £8 a ton.

Q.—That agrees with my figures.

A.—Yes.

Q.—So that is, roughly speaking, three times the 1912 prices; but you have only got 1914?

A.—Yes. At the beginning of 1914 it is about £2 9*s.* or £2 10*s.*

Q.—That is all right. That gives us a price of about three times the 1912 prices as the 1919 price.

A.—Over three times.

Q.—Let us call it three times?

A.—Yes.

Q.—Pig-iron is the basis of all metal prices in the way of iron and steel?
A.—Yes.

Q.—Therefore that would govern pretty well all the other prices?
A.—Yes, that is all the curves follow the pig-iron curves fairly.

Q.—It is from 50*s*. a ton in 1914 to 160*s*. a ton in September, 1919?
A.—Yes.

Q.—The price of cement you give as £2 0*s*. 7*d*. a ton in 1912?
A.—Yes; that was a Departmental running contract.

Q.—And £6 3*s*. 2*d*. in 1919?
A.—Yes; that was the only contract we placed, and that was in August.

Q.—Therefore that is three times the 1912 price?
A.—200 per cent. increase—three times the price.

Q.—Steam coal, 15*s*. 8*d*. per ton in 1912 to a maximum of 95*s*. a ton in 1919?
A.—Yes, at the end of 1919.

Q.—That would be six times?
A.—Six times in December.

Q.—Rails, £5 17*s*. 6*d*.?
A.—May I interrupt, because those particular figures for rails, I am afraid, are valueless. I will tell you why. They are actual contracts, and they are actual figures; but in 1919 both contracts happened to be placed early in the year; and you know the other figures that in 1919 prices were rising very steeply.

Q.—You must know the exact date when they are rising so rapidly?
A.—Yes; there was a big rise in January of over £2 10*s*. a ton.

Sir Frederick Hopkinson.—I personally remember buying rails in 1919 at £17 10*s*. a ton.

Chairman.—That is exactly the price as it would be with the increase of £2 10*s*.

Sir Frederick Hopkinson.—Yes.
A.—According to my curves here, they never quite rose to that; but it depends on the section and the weight. The heavier rails are cheaper per ton than the light rails.

Q.—Does not your curve show in 1920 it went up much higher still?
A.—Yes, they were climbing all through, to May, 1920.

Q.—Then steel plates?
A.—I could give you more accurate figures for rails if I might take them from Richards' table.

Q.—They are sure to be reliable?
A.—I think they are quite reliable.

Q.—Then they would be £5 10*s*. for August, 1914, against £14 2*s*. 6*d*. average throughout the four quarters of 1919.

Q.—That is nearly three times?
A.—Yes. Actually it is an increase of 157 per cent. It is just over two-and-a-half times.

Q.—Just mention the figures again?
A.—£14 2*s*. 6*d*. is the average over 1919 as against £5 10*s*.

Q.—It would be a little more than 157 per cent. Three times would be £16 10*s*., would it not?
A.—Yes; but I think my mathematics are probably quite correct.

Q.—Then steel plates?
A.—For steel plates I know the contract prices are not a very reliable guide, because steel plates vary in price according to the gauge of the plate.

Q.—I am speaking of plates ½-inch thick and upwards, not thin plates.
A.—Nearly all my contracts were for panel plates for railways, and they are very highly finished.

Q.—I do not think that would be much good. What I want is ship plates?
A.—For ship plates I think we get the best possible information out of the "Iron and Coal Trades Review." There is a very good table there showing all the prices from 1896 to 1926.

Q.—Just give us them from 1912 to 1919?
A.—In 1912, beginning in January, £7 3*s*. 9*d*.; February, £7 5*s*.

Q.—We do not want all the details.
A.—The average for the year is £7 14*s*. 10*d*.

Q.—What is it in 1919?
A.—£16 15s. 5*d*.

Sir Frederick Hopkinson.—That is about twice.

Chairman.—It is about 2¼ times.

Sir Frederick Hopkinson.—Will you tell me what it was in 1920?

A.—In 1920 the average was £23 13*s*. 4*d*., an increase of nearly £7 a ton.

Q.—That is when the order for the dredger was placed—May, 1920. Can you tell me what it fell to in the following year?

A.—In the following year it fell to an average of £16 9*s*. 2*d*.

Sir Frederick Hopkinson.—That is a tremendous drop.

Chairman.—What was it in 1922?

A.—In 1922 the average price was £9 18*s*. 4½*d*.

Q.—Call it £10 as against the highest price in 1919 of what?

A.—The highest price in any one month in 1919 was £21 5*s*.

Sir Frederick Hopkinson.—It fell in 1922 to something between £9 and £10?

A.—Just under £10.

Q.—Then traders' waggons; do you say the prices there were 200 per cent. above 1912 prices. That would again be three times?

A.—Yes, three times. Those are from my Consulting Engineers, as I said, Messrs. Rendel, Palmer and Tritton.

Q.—Contractor's locomotives, the prices in 1919 were from three to three and a-half times the 1912 prices?

A.—Yes.

Q.—Five-ton steam cranes were two and three-quarter times 1912 prices?

A.—Yes, two and three-quarter times 1912 prices.

Q.—The dredgers "Oswald" and "Campbell" in 1912 were £57·3 per ton. The "Sir George Lloyd" was £161·58 per ton. That is very nearly three times—an increase of 182 per cent.?

A.—About two and three-quarter times.

Q.—Stone-breakers £67 10*s*. each in 1912 to £163 to £172 in 1919?

A.—Yes. That is two and a-half times.

Q.—Bridge work does not come into it. So that it would appear from those figures that we should not be far out if we took the multiple as being three times in 1919 of what the prices were in 1912?

A.—I should think it is slightly below three times.

Q.—Some of them go above and some of them go below. I think it would work out to pretty nearly, if not quite, three times. For instance, coal, a very important factor, was six times. If you are to take the average, you would probably get a little more than three times. Would you agree with me that three times is about a fair multiple?

A.—I am afraid I do not. I think two and three-quarter times would be the fair one.

Q.—I said about three times; and I call two and three-quarters about three times.

A.—Very good, then, we agree.

Q.—That is near enough for my purpose.

A.—Yes.

Chairman.—We are very much obliged to you for these figures. They are a great help to us.

Mr. Llewellyn W. Lewis, recalled and further examined.

Sir Frederick Hopkinson.—Did you ever test the velocity of the effluent from the pipe from the pumping dredger?

A.—No.

Q.—Did you ever find out the percentage of material it was pumping?

A.—No.

Q.—Did you ever work out the percentage of solid matter pumped?

A.—No.

Q.—We were told by Sir Henry Lawrence when he was here that one of the reasons given to the Government for the poor output of the "Sir George Lloyd" in its first working season was that a machine of this complex character could not be expected to work well in the first season. Would you call a pumping dredger a machine of a complex character?

A.—That was not my statement.

Q.—I know it was not. I am asking you your opinion?

A.—But is my opinion required?

Chairman.—We want your opinion as chief engineer and as an expert. Was the " Sir George Lloyd " a machine of complex character in its pumping operations?

Sir Frederick Hopkinson.—I will put it in another way. Do you know a simpler machine than a pumping dredger for actual dredging?

A.—Than the pump?

Q.—Yes.

A.—It is quite simple.

Sir Frederick Hopkinson.—I will put it in another way. Do you know a simpler than a centrifugal pump?

A.—No.

Q.—Would you be surprised to learn that the cost of the " Kalu's " dredging for the first season she worked in Bombay was 15½ rupees a cubic yard?

A.—Yes; I should be surprised to hear that.

Q.—It would not very well agree with even the project estimate?

A.—It would not agree with any estimate, the project estimate for dredging or Sir George Buchanan's.

Q.—Nor yours?

A.—I did not alter Sir George Buchanan's figures.

Q.—You adopted his figure for dredging?

A.—I adopted his figure for dredging.

Q.—Including the supply of dredging plant?

A.—No; I had the figures for that, but for the general working costs I took Sir George Buchanan's figures.

Q.—You adopted his figures?

A.—Yes.

Q.—That is rather important. Did you know his original estimate for that was six annas a cubic yard, or do you know only what we have seen in his report?

A.—I only know what I have seen in his report.

Q.—Did Sir George Buchanan ever discuss with you the details of what the dredger ought to do in a year, because you know, in his report he says the dredger was going to work 15 hours a day 170 days of the year, and consequently would do 5,000,000 cubic yards a year. Did he ever tell you if he had made allowances for the ordinary daily loss of time on such a dredger?

A.—No; not that I remember.

Q.—The figures at the harbour dredging work out at a loss of time of about 36 per cent. You had had experience of dredging before, had you not?

A.—Yes.

Q.—At Rangoon?

A.—No; not at Rangoon.

Q.—I thought you had a dredger working at Rangoon?

A.—You mean the " Pelican "?

Sir M. Visvesvaraya.—The " Oswald."

A.—That was in Mesopotamia.

Sir Frederick Hopkinson.—Did not you have a pumping dredger working at Rangoon on the training wall?

A.—There was one, but I did not have anything to do with that. That was the " Pelican." When we worked the " Oswald " for two months at three shifts a day I think we got 20 pumping hours actual work out of the 24.

Q.—That is a loss of only 20 per cent.?

A.—Yes.

Q.—Was that in the seaway?

A.—Yes.

Q.—That would make a difference?

A.—Yes.

Q.—You had no moorings carried away by the tide? There was no trouble with tides?

A.—No.

Q.—That would make a considerable difference?

A.—Yes.

Q.—So that was 20 per cent. compared with the 36 per cent. you had there?

A.—I should say 36 per cent. would be quite reasonable.

Q.—Does not that mean in order to get 15 hours' pumping time you have to have the dredger working 22½ hours a day?

A.—I take it so.

Q.—That is a matter of arithmetic?

A.—Yes.

Q.—Did Sir George Buchanan ever tell you it was proposed to work the dredgers 22½ hours a day?

A.—No.

Q.—Who sent out the crew originally to begin the work in December, 1923. Who arranged what crew were to be sent?

A.—They would be sent out by Sir George Buchanan—at least by the High Commissioner or the India Office.

Q.—The High Commissioner would only act on instructions from Sir George Buchanan?

A.—Yes.

Q.—Do you know that he only sent out a single crew sufficient to work the dredger for 8 hours a day?

A.—No.

Q.—Did you never find out. Did he write to you and say that he was only going to work the dredger 8 or 9 hours a day?

A.—I do not remember.

Q.—So that you had no definite programme in December, 1923, of what the dredger was to do. You simply had a single crew and you started the dredger to work with that?

A.—I think that is so.

Chairman.—At all events you had no programme that provided for anything like 15 hours of pumping work per day?

A.—No. I think it was intended to get the crew together—to get the thing to work.

Sir Frederick Hopkinson.—We were told by somebody that they were having an experimental season's work?

A.—I never heard it was an experiment.

Q.—You would not experiment with an expensive plant of that kind?

A.—No.

Chairman.—Do you say you never heard that?

A.—Never heard what?

Q.—That the first season's work should be regarded as purely experimental?

A.—Was that something which was written after I left?

Q.—I want to know from you. Sir George Buchanan apparently stated when complaint was made about the 1923-1924 working that the first season's working in an undertaking of this kind must be regarded as purely experimental?

A.—Yes.

Q.—What do you say to that, as an explanation. What do you think of it. Does it satisfy you?

A.—I have not really considered it.

Q.—Consider it now. You told me yesterday that it would take about six weeks in your opinion for the crew to shake down?

A.—Yes, perhaps it would.

Q.—Knock off that six weeks.

A.—Perhaps it might take more.

Q.—Beyond that is there in your opinion any reason for saying that the working of the plant and the working of the undertaking should be experimental during the first season?

A.—Well, I really cannot justify all that was written by other people.

Q.—You are not asked to justify anything. You are asked to give us your opinion whether that would be an adequate explanation of the failure of the dredger's operation in 1923-1924, to say that the first season must be regarded as an experiment?

A.—I should not look for the best results in the first season.

Q.—Did you regard yourself as embarking on an experiment in 1923 when you began dredging operations?

A.—No, it was a serious undertaking.

Q.—In which you were going to endeavour to get 2,000 cubic yards per hour out of the machine?

A.—Yes

Sir Frederick Hopkinson.—There was nothing new about it?
A.—No.

Q.—With regard to sealing the sea wall, I understand that you saw the dredged material, the mud, going through and you were anxious to stop it. Did you actually see it go through the rubble mound?
A.—I saw the material on the rocks which had evidently come from the dredger.

Q.—That had gone through?
A.—That had gone through.

Q.—Did you look upon that as being at all serious?
A.—There was not very much.

Q.—Did you look upon it as at all serious?
A.—I looked upon it that it was a matter which would have to be dealt with.

Q.—Remedied?
A.—Yes.

Q.—With a view to remedying it, did you propose to put some softer material inside the rubble mound and so prevent the mud washing through?
A.—Yes.

Q.—Did Sir George Buchanan approve of that?
A.—No, he vetoed it.

Q.—On what ground?
A.—I think that is in the correspondence.

Q.—Do you remember?
A.—He said he did not want it done then.

Q.—Was that all?
A.—He said afterwards it might be done later up to high-water mark, neap tides.

Q.—Did he say the material was not worth saving?
A.—I do not remember that. Of course, it is a long time ago to remember.

Q.—At any rate, he was not at all anxious to save it. He vetoed the sealing of the mound?
A.—Yes.

Q.—That showed he did not care about saving it?
A.—I think it is an assumption you can make.

Q.—It did not matter. It was not worth saving money on. We have not said anything yet about the 20-ton blocks. It was originally proposed to face the river wall with 20-ton concrete blocks thrown in pell-mell?
A.—Yes.

Q.—Did you find from experience that was not necessary?
A.—I came to the conclusion it was not necessary.

Q.—And that blocks from three to five tons would be ample for all requirements?
A.—Yes.

Q.—Therefore it follows as a matter of course that that 20-ton crane was not required and the special concrete block-making plant also was not required?
A.—That was so.

Q.—When was it decided to abandon the use of the large blocks?
A.—I think the final decision came in 1922.

Q.—By that time the crane had been bought and delivered?
A.—Yes.

Q.—Whose idea was it that they would not be required?
A.—I think I started that before I left London.

Q.—That meant a saving of something like 40 lakhs, did it not?
A.—It would have made a very big saving.

Q.—Therefore that 40 lakhs should be taken off Sir George Buchanan's estimate of 367 lakhs, after giving him the difference of the cost of the stone blocks you put there?
A.—Yes.

Q.—Therefore his estimate instead of being 367 lakhs would be 327 lakhs?
A.—Well, I do not know the figures.

Q.—Roughly speaking, that is it?
A.—I had considerable difficulty in getting a block yard anywhere.

Q.—That is why I suggested you should have taken moorum from the quarry and made one?
A.—Well, there was a difficulty about that. I suggested that we should first of all see whether we could not get large enough blocks from the quarry.

Q.—Which you ultimately did?
A.—Which we ultimately did.

Q.—And so saved a lot of money?
A.—Yes.

Q.—I think experience up to the present time shows that that alteration was a wise one?
A.—Yes.

Q.—You also reduced the thickness of the concrete wall on the rubble mound from 16 feet to 12 feet?
A.—Yes, on the Colaba end.

Q.—Not at the other end?
A.—No, that was kept at 16 feet.

Q.—You put in a hollow wall instead?
A.—Yes.

Q.—So that you reduced the quantity of concrete considerably?
A.—Yes.

Q.—Therefore the value of that reduced concrete must also be taken off Sir George Buchanan's original estimate of 367 lakhs?
A.—Yes.

Q.—In addition to that you also raised the level of the mound, did you not?
A.—Yes.

Q.—Therefore there is another credit to be given there?
A.—We reduced the depth of concrete in that way by three feet.

Q.—And increased the quantity of stone?
A.—Yes.

Q.—I suppose you would do it from motives of economy largely?
A.—No.

Q.—Partly economy?
A.—Well it was economical to do it and it was more convenient.

Q.—Had you worked the whole reclamation from No. 8 Block, Colaba end, you would not have required all this expensive work on Marine Lines end. You would not have required to increase your quarry output from 800 to 2,000 tons a day. You would not have required to have the plant made out there. Is not that so?
A.—If we had done the work from one end.

Q.—Was not it the obvious thing to finish the reclamation from the Colaba end first of all because it is nearest the dredging, and, secondly, because you get paid for it as soon as you do it?
A.—Yes.

Q.—Was not it to everybody's interest to begin at the Colaba end and finish it as you went, because all that wall you built is now lying there doing nothing at all, except eating up interest. Was there any reason that you knew of why the work should be done from both ends?
A.—The only reason that I knew was to get it done quicker.

Q.—You could not do it any quicker. You built the wall in three years. What is the good of that if your dredging at that time was going to take seven or eight years? What is the advantage?
A.—The dredging was to be done quicker.

Q.—It was to be done in five years but it was not to be started till the end of 1922 at any rate. That would bring it up to 1927. Therefore, what is the advantage of having the wall finished in 1924. It is not like port—it does not improve with age?
A.—It was not going to be finished in 1924.

Q.—It was finished in 1924, except 1,800 feet?
A.—No.

Sir Frederick Hopkinson.—Is not that so?

Mr. Elgee.—No, it was carried on for another 1,500 feet after Mr. Lewis left.

A.—That is at Marine Lines, and considerably more at Colaba.

Sir Frederick Hopkinson.—1,500 feet done at Marine Lines in 1925?

Mr. Elgee.—Yes.

Sir Frederick Hopkinson.—It could have been entirely completed in 1925?

Mr. Elgee.—It could have been.

Sir M. Visvesvaraya.—Did this proposal to build the sea wall from both ends emanate from the administrative side or the technical side of the organisation. Was it your proposal?

A.—No, these are the conditions we started on. That was the condition of the problem when I started.

Q.—You wanted it from both ends?

A.—It was to be done from both ends. I was told that. I was to work it at both ends.

Chairman.—Who told you?

A.—I think that is in the documents——

Q.—Try to recollect—who told you?

A.—Sir George Buchanan told me.

Sir M. Visvesvaraya.—The idea originated in Bombay and not from Sir George Buchanan. Sir George Buchanan confirmed it afterwards.

Chairman.—He is speaking of 1920. (*To the Witness*) : Do you mean in 1920 when you went into Messrs. Meik & Buchanan's office you then understood that one of the integral parts of the scheme was to build the wall from both ends?

A.—Yes.

Q.—That is in 1920?

A.—Yes.

Q.—August?

A.—In August, 1920. That is what I was told was to be done.

Q.—You learnt that in London first of all?

A.—I did not meet anybody who knew anything at all about it until I got to London. It must have been in London.

Sir Frederick Hopkinson.—So that it was part of the engineers' scheme to build it from both ends, so that makes it all the worse.

Chairman.—I do not know about that, but that is the fact. It is the 25th April, 1921. That shows Messrs. Meik & Buchanan did propose to begin the wall from both ends

Sir Frederick Hopkinson.—But the letter about beginning at both ends is July, 1920.

Chairman.—Then you are right, Sir M. Visvesvaraya. This is very important. We must get this quite clear. When you got to London in August of 1920 you found that part of the scheme was to build the sea wall from both ends?

A.—Yes.

Chairman.—We have certain documents which enable us to see how that suggestion arose. We need not trouble you with them. We do not base any question upon it because we know about it; but you are quite right about that. It was in August, 1920, that it was part of the scheme.

Sir Frederick Hopkinson.—In your project estimate you did not provide for these protecting concrete blocks?

A.—No.

Q.—Therefore there is another 38 lakhs to go on to your estimate to compare with that of Sir George Buchanan. Instead of being 702 lakhs, your estimate is 813 lakhs. Do you see the point? Is not that so? Your estimate was 702 lakhs plus machinery, which was roughly 70 lakhs?

A.—Yes.

Q.—That is 770. Your estimate did not include concrete blocks which are 38 lakhs, and therefore your estimate must be increased by 100 lakhs compared with Sir George Buchanan's estimate of 1919.

A.—There is something in my estimate for broken stone.

Q.—I give you credit for broken stone, but not for concrete blocks.

A.—Concrete blocks are not included in my estimate, but broken stone was.

Q.—They are estimated to cost 38 lakhs. My point is, if those are added on to your project estimate your total will be 813 lakhs to compare with Sir George Buchanan's 307. Is not that so?

A.—I think so. I cannot work it out just now.

Q.—Is it the case that up to the 10th August, 1923, you had no tests of cement?

A.—No; the tests of cement were made by J. A. Mitchell & Company at the works from the beginning. There was a definite contract.

Q.—Nearly at the bottom of page 94 Sir George Buchanan writes : " Some time ago we asked to be furnished with particulars of cement tests, but we have not pressed the point because we understood all cement used in the works was thoroughly tested and certified to by Mr. Mitchell, who is an expert in this matter." My question was that Sir George Buchanan did not know of any cement tests up to that date, which is August, 1923.

A.—My answer to that letter is on page 96 : " Lotus brand has been tested by Messrs. J. A. Mitchell & Company and passed as complying with the British Standard specification, which is in accordance with your demand."

Q.—But the point I was making is that Sir George Buchanan did not, apparently, know anything about it or he would not have written that letter.

A.—The tests of cement were sent to my office regularly and filed.

Q.—But not to Sir George Buchanan?

A.—No.

Q.—He did not know?

A.—Well, I do not know. Apparently he did not.

Q.—He could not have written that letter had he known?

A.—The implication that he makes there is that the Lotus brand cement was not tested by Messrs. Mitchell & Company, and in that assumption he was quite wrong.

Q.—The point I was putting to you is that at that date Sir George Buchanan did not know anything about the cement tests, because he says: " Some time ago we asked to be furnished with the particulars of cement tests."

A.—But he understood that all the cement was thoroughly tested and certified to by Mr Mitchell, and that was perfectly true.

Q.—But he himself did not know anything about it. He had not seen the tests?

A.—I do not think the test papers were forwarded to him. They were kept in Bombay.

Sir Frederick Hopkinson.—On page 69 there is this letter or note from you: " Inspection of Mr. Davidge's plan indicates the position of the storm water drains for the area of the reclamation." That is not dated, but it comes after a letter of the 11th November, 1923.

Chairman.—I should think it is the 12th January.

A.—I think that must be it.

Sir Frederick Hopkinson.—On the 18th April, 1923, on page 81, Messrs. Meik & Buchanan say: " We have no information in this office as to the level at which the existing drains discharge."

A.—I think I replied to that later on and said that most of it was given.

Q.—In the beginning of the letter they say: " We have examined the proposed arrangement of storm water drains as shown on the plans handed to Mr. Halcrow, but this was in April, 1923." So that apparently there was nothing done about storm water drains before this date?

A.—Yes.

Q.—He says: " This proposed arrangement of storm water drains."

A.—I forget now when the drains were started. I cannot remember all these things.

Q.—We may take it as pretty definite or he would not have called it " a proposed arrangement."

A.—I cannot say about the date. I cannot remember, but that is a *façon de parler* of Sir George's. I think that is the way Sir George Buchanan put it. The drawings and designs had been made by me.

Q.—There was nothing definite. It was only a " proposed arrangement."

A.—They were definite. Those were plans for definite work.

Q.—They had not been built or else it would not be called a " proposed arrangement " ?

A.—Those were for all the drains, and they were not all built at once.

Q.—Do you suggest some had been built at that date?

A.—I think some of them had been started, but I am not quite sure.

Q.—In block 8 the reason for delaying the dredger to December, 1923, was that the storm water drain had not been built?

A.—I do not think that was the case, quite.

Q.—But the drain had not been built—the 2,300-foot drain?

A.—It is very difficult to give dates at this distance of time without any record.

Chairman.—We will try and help you. At page 142 of the evidence this answer was given: " So far as we are concerned there was a definite programme of work for each year prepared by the chief engineer. (Q.) Who drew up your programme? —(A.) The chief engineer, Mr. Lewis. (Q.) Was that under Sir George Buchanan's instructions?—(A.) That I do not know. (Q.) But that programme provided for storm water drains?—(A.) Yes; after 1922 when the question of construction was thoroughly gone into. (Q.) Till then the Department was sleeping and never thought of it "—that is, storm water drains—" —(A.) I do not say that. In July, 1921, the work on the designs of the storm water drains was commenced. The work was always going on on the storm water drains after 1921." Does that accord with your recollection?

A.—July, 1921?

Chairman.—So this witness says, but if so, it is curious.

Sir Frederick Hopkinson.—It must have been a very early stage.

A.—No; we did not get down to that.

Q.—You had not done anything by 1921?

A.—No.

Chairman.—What accords with your recollection? Did that programme provide for storm water drains?

A.—Yes.

Q.—After 1922, when the question of construction was thoroughly gone into?

A.—Yes.

Q.—I think that " 1921 " must be a misprint for " 1922 "?

A.—Yes.

Sir Frederick Hopkinson.—That practically agrees with this letter, because this is a letter from London of the 18th April, 1923, after 1922, when they were thoroughly gone into. While we are on the storm water drains, why did you make them all of blocks?

A.—I thought it would be more convenient to build them in that way so that we should not be hampered so much by tide.

Q.—Why did you make them at Kandivli?

A.—Because I had no room to do them in Marine Lines or anywhere else.

Q.—Could not you have reclaimed an area?

A.—Well, I should have had to bring down the bulk of the material from Kandivli.

Q.—You had got to do that even when it was made into blocks?

A.—All the construction people down in Bombay were all very hard at work and very busy. We thought we could carry the work out at Kandivli, and I came to the conclusion that there would not be any great extra expense.

Q.—We noticed that the blocks made in 1923 are still there.

A.—I do not know how that could be.

Chairman.—We were told that £21,000 worth of blocks were lying there idle. That has been given in evidence.

Sir Frederick Hopkinson.—That is at a cost of interest of about £1,200 a year. Do you know when you began working at the Colaba end of the wall?

A.—In 1922.

Q.—Mr. Thomas said that it began in October, 1921; but there is not much in that. I have a note that on the 11th August, 1922, you were getting on with the storm water drains lay-out, so that pretty well fixes it. I think we ought to go a little further about the specification, because Mr. Elgee told us he had no specification at all for building the sea wall, and you have produced one. Do you think he had a copy of this?

A.—I cannot say. I think, as a matter of fact, the work was altered in character so much that that original specification became valueless.

Q.—Was there another one drawn up to replace it?

A.—I cannot say there was.

Q.—So that Mr. Elgee was probably making an accurate remark when he said he did not have a specification?

A.—Quite possibly.

Q.—I asked Mr. Elgee what cement he put in per cubic yard, and he told me that he decided that himself.

A.—I think we settled that all round. That was settled by me after tests, 1, 2½, 5.

Q.—The same with the size of the stone and the quantity of sand to be put in—that was all settled by you?

A.—Yes; after definite measurements and experiments.

Q.—This looks to me to be merely a sort of dummy specification. For instance, it says: " Proportion of broken stone and sand and cement for the concrete required for different portions of the work as hereinafter given, and as described on the drawings is to be applicable to the quantity of dry materials, broken stone or ballast, stone and cement before the admixture of water thereto." So that it does not mean anything—that has no meaning.

A.—When the changes of programme came I did not bother about it any longer.

Q.—Did you think it was not worth bothering with?

A.—No; there were some things that I found useful. It is the usual sort of standard specification.

Q.—" All timber supplied for use in the works shall be of the best description." I do not think there is anything important in it. I would like to get quite clearly from

you that there are no plans in existence which you know of in 1919 other than those in Sir George Buchanan's report.

A.—There were Mr. Kidd's plans. I know of no others besides Mr. Kidd's plans and such plans as there are in Sir George Buchanan's report—not in 1919.

Q.—That is all I want to ask you.

A.—There is one point I would like to mention about the gantry. There is one thing it helped us in, and that was the rapidity of the execution of the work.

Q.—I entirely agree that it is a very convenient way of doing it.

A.—We were able to tip from it and carry on our tipping going ahead. At the same time we were able to do our concreting behind, so that we came on and brought the work up. Instead of having to complete the tipping first and then come along and do our mass concrete wall, we were able to work them simultaneously.

Sir Frederick Hopkinson.—I do not at all dispute that it is a convenience.

(*Adjourned to to-morrow at* 11 *a.m.*)

The Committee Assembled at 11 a.m. on the 15th October, 1926, all Members being present.

54th Witness, Lord Lloyd of Dolobran, P.C., G.C.S.I., G.C.I.E., D.S.O., Governor of Bombay, 1918-23.

Chairman.—I think you arrived in Bombay on the 16th December, 1918?

A.—That is as far as I remember.

Q.—At what date did you first learn that you were going to be Governor of Bombay?

A.—I think it was in August—the August previously, as far as I remember.

Q.—August, 1918?

A.—Yes.

Q.—I suppose thereafter, between August and November, you went to the India Office from time to time to acquaint yourself with the problems with which you had to deal?

A.—I did so.

Q.—Was one of the matters which was specially brought to your attention the condition of housing in Bombay?

A.—It was, I think, actually the first of all. The Secretary of State spoke about that at the very first interview—indeed before I was appointed.

Q.—Was the housing problem regarded as a matter of vital importance by the Government of Bombay?

A.—I cannot say whether it was regarded as a matter of vital importance by the Government of Bombay at that time, although I shall have something to say about that in a moment; but as regards my interviews with the Secretary of State, he pressed upon me the urgency of the problem. I had not until I went to Bombay any knowledge of what the Government there had thought, but he pressed it upon me, saying that the last four or five Governments had failed to deal with the problem, he considered it was vital and I was to take it up with the greatest urgency that I could.

Q.—I wonder whether you would tell us in your own way the information that was given to you in London before you sailed for India, and the conditions which you found when you arrived in Bombay?

A.—Well, subsequent to the very definite instructions from the Secretary of State, which I received before and immediately after appointment to my office in Bombay, which were the results of impressions created upon his mind by his recent visit to India, I was informed that the congested condition of Bombay, especially as it affected the working classes, had long been a matter of concern to the Government of Bombay and the Secretary of State.

Q.—Would you just repeat that?

A.—When I was appointed Governor of Bombay in 1918, I was then informed that the congested condition of Bombay, especially as it affected the working classes, had long been a matter of very grave concern to the Government of Bombay and to the Secretary of State. The official view of the situation and the measures which were under consideration for amelioration of the social conditions are, I think, all set forth in the official correspondence available to the Committee. When I arrived in Bombay towards the end of 1918, in December, 1918, I found there a very strong popular feeling in regard to the need for dealing with this question as an urgent matter. The Municipal Corporation of Bombay, for instance, pressed it upon my attention in the address which they presented immediately on my landing, and in the course of the next

few days several leading citizens of Bombay in interviews which I had emphasised the seriously overcrowded condition of the city. Naturally, I became fully impressed with the grave extent to which congestion in Bombay City had increased during the years of the War. That was obvious. But for over 20 years, since the outbreak of the plague —in Lord Sandhurst's times, as far as I remember——

Q.—1897?

A.—Yes—the authorities had been grappling with this problem of overcrowding. Even before this period the reclamation of Back Bay was, as I think this Committee knows, one of the methods of expansion suggested for the consideration of Government. I think that was under a Committee approved by Lord Reay in 1887. The city of Bombay Improvement Trust was later constituted to deal with some parts of the whole problem; but during the period of the War its activities had been severely restricted by the virtual closure of the Loan market. There is one criticism on the operations of the Improvement Trust which had a bearing on subsequent measures. The clearing of the slum areas by the destruction of houses declared to be uninhabitable and the removal of other property in order to widen streets for sanitary reasons, or for improvement of main and minor communications, were alleged to have intensified the congestion. In 1919 the congestion in Bombay amongst all classes, in my opinion, could be described as appalling. There was infant mortality—I am afraid there still is—of 60 per cent. and perhaps more; that is to say, a great deal more than half of the children born died entirely owing to insanitary conditions. Various estimates have been made of the increase of population at that date, but it is sufficient, I think, as an illustration to give an estimate made at the time by the Municipal Commissioner of Bombay. His estimate of the population, which was, I think, 1,176,000, was 20 per cent. above the Census figures of 1911. The figures of the subsequent Census in 1921, during my period of office, were practically the same as his estimate. I have Government figures given to me as 1,175,000, about; but my recollection is, as I was responsible then for the Census, that the Non-co-operation Movement very much paralysed our efforts in getting an accurate Census. My own view, though I cannot substantiate it, was that the population was probably not quite so low then, but it is very hard to say. The Non-co-operation Movement upset us in that way.

Q.—Some witnesses have put it at about 1,400,000.

A.—It is impossible to say. The Census is, I think, never very accurate.

Sir Frederick Hopkinson.—At least, in India.

A.—In India; but at that period it was less accurate than usual. Careful inquiries were made in order to estimate correctly the degree of congestion. As far as I could I made a personal investigation. Probably, I think, I am the only Governor who has personally been down all through the slums and seen them for himself, as very few leading Bombay citizens have done, where you find four families living in one room, pitch dark, half a swamp in monsoon times, without any light or air very often—in incredible conditions. At the Census of 1911 it was ascertained that 80 per cent. of the population were living in one-room tenements. The figures affecting four-fifths of the population were, therefore, important. In that first year we had raging, the cholera epidemic, which is doubtless remembered by the two of your colleagues, Mr. Chairman, who sit on your right. The figures then of mortality ran to about 600 or 700 deaths a day, probably immensely increased by the foul conditions of the city. The estimate of the Municipal Commissioner was that the total shortage of one-room tenements was 49,000—you must forgive me if I am giving you figures you have already got—exclusive of 15,000 required to replace insanitary huts and tenements unfit for human habitation. The total shortage of 64,000 tenements was almost 30 per cent., I think, of the total number of one-roomed tenements required to house the section of the population living in this type of residence—perhaps residence is too ambitious a word, this type of lodging. Or, to put it in another way, it might be said that over a quarter of a million of the working classes were without proper homes. The Municipal Commissioner supplied a further illustration of overcrowding by stating that in 238 overcrowded houses throughout all parts of the city the number of occupants was found to be 51,500, as compared with 27,300, which was all they were fit to accommodate. I have given some idea of the figures as far as information is now available to me for classes occupying one-room tenements, because they are the largest section of the population. But they are only illustrative. Every section of the population was seriously affected in 1915. The overcrowding of the middle classes was equally intense, and I think, perhaps, none suffered more than the lower middle classes, clerks and so on. I am informed that even to-day there are a very considerable number of people living in temporary hutments in Bombay in a thoroughly insanitary condition, and certainly unsuitable for a town which claims to be, not the second largest city in India, but the second largest city in the whole Empire. I think there is a friendly rivalry with Calcutta as to the figures, but it is always claimed by Bombay it is the second largest city in the Empire. There is very little difference. But, apart from the lower

middle classes, the pressure existed all the way up, and even on Malabar and Cumballa Hills the conditions soon gave rise to the erection of big blocks of flats to replace the more spacious bungalows of the well-to-do. I come now to the Fort area. There the pressure on office and business accommodation was severe. The Rent Act had been passed to prevent exploitation of the tenants of all classes, but evasion was rampant, and large premia were paid for occupational rights, while old and dilapidated properties changed hands at inflated prices. It was urged by many business people at that time that there was a risk of business leaving Bombay on account of the difficulty and the cost of getting suitable office accommodation. Briefly, then, while the bulk of the population of Bombay city was living in 1919, and had done so for years before, under conditions which were a menace to public health and probably dangerous to society, the housing conditions were oppressive to all. I have mentioned the ravages of cholera, and I might have added the more regular scourge of malaria. The congestion in the business area, I have said, was great. The land and the buildings fetched amazing, even ridiculous prices in some cases owing to speculation. The Rent Act acted as a check for sitting tenants, but the evasion I have spoken of and the consequent oppression were rampant, and the Act could only be a temporary palliative. While this is not the occasion, perhaps, for me to explain all the measures taken to deal with the conditions of 1919, if it is convenient to you I would say here something about the Back Bay Reclamation Scheme as an integral part of the general measures. Before dealing with the reclamation scheme as it directly affected the social life and the public life of Bombay, it is necessary to say something about the congestion as it affected the military authorities, of which, so far as I can see, you have heard very little on this Committee so far. The Indian Infantry Barracks on the Marine Lines were condemned. I visited them personally, and they were very rightly condemned. They should have been condemned years before in my judgment. Their condition was a cause of discontent amongst the men, so much so that it was even suggested that discontent might result in disaffection. It was not an ideally peaceful period, as you remember, in 1919, and those matters had to be very gravely considered. In the monsoon the troops living on mud floors had mud very often for several inches, and in some parts of the room I have seen it up to more than that, of wet mud on which to live. The other military offices and properties in the Fort were old, and, as a result of confused growth and lack of town-planning, inconvenient and generally out of date. Concentration therefore at Colaba was for many reasons greatly desired by the military authorities themselves, but, as you know, the space there was already crowded and inadequate. Reclamation at Colaba could be the solution of the problems of the military authorities. I desire to emphasise here that the military consideration was an important one up to a point. The unreclaimed area at Colaba was low-lying and unhealthy, and, apart from other considerations, its reclamation was most desirable for the health of the troops and of the residents in that vicinity. As regards the public generally, the experience of the Improvement Trust had shown the danger of dealing with small and overcrowded areas if adequate provision were not made for housing the dispossessed tenants. That is to say, to put the matter colloquially, we found ourselves in a vicious circle. You could not condemn unless you could destroy, you could not destroy unless you could re-house, and you could not re-house unless you provided new land. You had to get out of that vicious circle. It was not any easy problem, I can assure you. I am not suggesting that the operations of the Improvement Trust did not take a sufficient account of this danger, but the danger was always there. The public were alive to it, and it coloured public criticism. By 1919 the time had long passed for putting the destruction of slum property in the forefront alone. There was already great overcrowding. Extensive provision of housing for accommodation was imperative, and for that purpose land in Bombay had to be found and developed. From the very earliest days a very real development of new areas had been an ever-recurring problem in the Island or Islands, the Heptanesia, the seven islands, as they were, of Bombay. It has been suggested that the housing schemes of the Government in Bombay City, the development of the North of the Island by the Improvement Trust, and the opening up of residential suburban areas in Salsette, were a sufficient solution. (I hope I am keeping myself to the point on which you wish to hear me. Perhaps you will check me if I go beyond the point.)

Sir Frederick Hopkinson.—It is all part of the scheme?

A.—Very much so; but I only did not want to go beyond it. I was saying it has been suggested that the Housing schemes of the Government in Bombay City, the development of the North of the Island by the Improvement Trust, and the opening up of the residential suburban areas in Salsette, were a sufficient solution; but there has always been a very strong body of opinion in favour of the reclamation of Back Bay. The Back Bay Reclamation Scheme was, as you know, not new when I arrived in Bombay—far from it. It had been under almost continuous investigation and consideration since 1907, and assumed its present shape I think in 1912. Even at

that time an unofficial Committee recorded the view that the development of the North of the Island and of Salsette could not meet the difficulties of the Fort area. The Fort has always been an overcrowded locality; and before the war the enormous increase in shop and office rents was burdensome. Perhaps I put it mildly when I say that any action to check the rise in rents and land values had not had very strong support from the local landlords. The opposition to the scheme in 1919 was intensified by reason of the enormously enhanced value of the Fort property at that date. The keenest opposition was made, perhaps is still being made—I do not know—by some who acquired properties in the Fort when prices were at about the summit. I think the Indian members of this Committee know that very well. On the other hand, many enterprising and sagacious business men in Bombay, with large financial resources of their own and under their own control, combined in 1917 for the purpose of reclamation in Back Bay by private enterprise. They were not in that respect entirely philanthropists, and there were no better judges of the needs of that time and of the future. They would not have taken it up unless they had thought it was a good scheme. One of the things which affected the decision of the Government in undertaking the scheme as a public work had reference to the demand for more open spaces. I do not know how much stress has been laid upon that by this Committee, but I think it is of great importance.

Chairman.—We have had the facts put before us; but no great stress has been laid upon that. It has been rather obliterated by the fact that it was assumed that the open spaces would have to be diminished because of the present anticipated cost.

Sir Frederick Hopkinson.—But we see that great allowance has been made for those open spaces.

Chairman.—Yes; in the original scheme great allowance was made.

Witness.—I only wish to make the point that a Government that is responsible for the re-planning of a great city, in which are comprised all the youth of the town, educational establishments on which large sums of money are being spent, are bound in my judgment to provide for the health of their bodies as well as for their minds; and there was very little provision for that. Outdoor recreation and exercises have become popular to an amazing extent nowadays amongst all classes of Indian society; but their enjoyment has been severely restricted by the lack of open spaces and facilities. For the masses there has been practically no provision at all, and there should be provision. The schools had no playgrounds, generally speaking. There are a few on the Front at present, but there is hardly an exception to this state of affairs. Even the mixed and middle class schools have no recreation grounds, and no space was available in the vicinity of the Fort for their further provision. It was a difficult and essential feature of the Back Bay reclamation Scheme to make elaborate provision for what was considered as a vital social need. That is broadly speaking I think all I I have got to say for the moment on the particular aspect of the question which you put to me, Mr. Chairman; although if you wanted me to give further reasons for the essentiality, as we considered it, of the Back Bay scheme as an integral part of the whole of our housing operations, I could very well do so. The point that I want particularly to make is this. The conditions were appalling. Of that there can be no possible question. They had to be remedied. I received those instructions. They had been deferred for years under several Governments; and it seems to me that my Government was fully justified, and they would have been failing in their duty if they had not taken urgent and courageous steps to try and put an end to so grave a social ill. That is all I think I want to say for the moment on that particular head.

Q.—Those were the conditions which you had in your mind that finally decided you and your Government to create the Development Directorate?

A.—That is so.

Q.—Which was a body not merely concerned with the Back Bay reclamation, but concerned with all these other matters, with the provision of chawls and other matters for Salsette and the general expansion of Bombay?

A.—That is so.

Q.—You have referred to 1912. That, of course, is a reference to the examination and report of Mr. Kidd?

A.—That is so.

Q.—That Report having been made in 1912, the next fact of importance with which I suppose you would have been acquainted was a matter of which you have told us, namely, the creation of two syndicates, which ultimately combined in December, 1917, and January, 1918, with a view to reclaiming the Back Bay area as a business proposition on their part?

A.—I believe so.

Q.—The proposal of that joint syndicate was examined by the Government?

A.—You are referring to Mr. Kidd's investigation?

Q.—No; for the moment I am on the proposition of the syndicate, namely, that they should have an option, and should themselves reclaim the 1,100 odd acres. Their suggestions were examined. There was a note by Mr. George Carmichael to which I need not refer you, but the Government of Bombay took up the matter by a telegram of the 16th October, 1918?

A.—That is before my arrival.

Q.—I want to emphasise that. On the 16th October, 1918, which was two months before your arrival, the Government of Bombay sent this telegram to the Secretary of State for India: "Government of Bombay consider a re-examination of Back Bay Reclamation Scheme a matter of special urgency and hence shall be obliged if best qualified man available is chosen and sent to Bombay for that purpose. He should know recent work of the same kind and latest mechanical devices, and be entirely independent of Lowther, Griffiths and Tata Syndicate." No answer was apparently received to that telegram during the period of Lord Willingdon's office. On the 8th April, 1919, at which date you had assumed charge——?

A.—I think so.

Q.—A telegram was sent by the Government of Bombay to the Secretary of State in these terms: "Back Bay Reclamation Scheme. Government of India had asked you to send out best expert available to examine and make final report on above. The Government of India had also asked us to send all plans to Delhi for transmission to you, in order that expert may study them before departure. (1) I think this procedure involves unnecessary delay, in view of the fact that expert must be here to see conditions just before monsoon breaks as well as after it. (2) I have consulted Government of India and Sir Claude Hill concurs with me in proposing you should send expert out at once to arrive Bombay not later than third week of May. (3) All plans and information essential to experts' study now here. (4) Lord Sydenham or W. L. Cameron, late Chief Engineer, Bombay, would advise regarding choice of expert." Then "(5) Failing your ability to find expert in short time available, my Government would agree to use Sir George Buchanan, whose services would probably be available, and whom the Government of India recommends. (6) My telegram has been drafted in consultation with the Government of India and is being communicated to them. (7) Please telegraph immediately whether expert can be found in time to arrive by middle of May, or whether we should proceed with Buchanan"?

A.—I think I remember the telegram.

Q.—I would like you to have it before you. It is on page 8. (*Document handed to Witness.*) You notice in paragraph 5 of that telegram you mention Sir George Buchanan?

A.—Yes.

Q.—You state that the Government of India had recommended him?

A.—Yes.

Q.—Did you yourself go to either Simla or Delhi?

A.—I do not think so at that period; I do not remember.

Q.—Did Sir Claude Hill come to you?

A.—I think he came down to Bombay, but I cannot be sure. I think I did not go up, so far as I can remember, until the late spring, but that was on another matter. That was over the disturbances, so far as I recollect.

Q.—In using the phrase "whom the Government of India recommends," was that the recommendation of Sir Claude Hill on behalf of the Government of India?

A.—I presume so, but I cannot be sure at this distance of time. It may have been a telegram, or it may have been Sir Claude Hill personally. I am afraid I cannot remember at this time.

Q.—At that time did you know Sir George Buchanan?

A.—Yes. I think I had shaken hands with him in Mesopotamia, when I was serving in the military camp. I did not know him, but I think I had actually met him once. I am not even sure that I had met him before, but I think so.

Q.—So that by the first telegram of the 16th October, before your arrival, the Government of Bombay had simply requested that the best qualified man available should be engaged?

A.—That appears to be so.

Q.—You in your telegram also are pressing that the Secretary of State should send an expert out at once to Bombay, but that if he cannot arrive within the time, should you proceed with Sir George Buchanan?

A.—That is so.

Q.—Then on the 25th April, 1919, you received a reply to that telegram?
A.—Yes.

Q.—" Sydenham suggests appointment of Cameron as expert, and doubts whether it is possible to send a new man out in May. I have not sounded Cameron. I could probably secure Frederick Palmer, of Rendell Palmer & Tritton, if you would wait for him till October "—then it sets out his qualifications. Then they put this question : " Is it essential that the expert, if he has already the knowledge of monsoon effects should be present throughout entire period of monsoon? Any such condition is deterrent." Then the Government of India await a reply and ask for a reply on the 25th April. Then we get your answer of the 26th May, 1919 : " Reply was postponed in view of impending discussion with Sir Claude Hill and his return to England." Then it speaks about the difficulties of getting the people mentioned : " In view of the difficulty of getting Palmer out before October, my Government decided to employ Sir George Buchanan, who is at present engaged upon the work, and will probably, after concluding his preliminary investigation proceed home to make further enquiries regarding dredging plant and material." I think Sir George Buchanan was notified about the 7th May that he might be wanted to report upon this matter? If you will take that date from me, I think that is right?

A.—I could not say.

Q.—But at all events. we know from his own report that he received a letter dated the 30th May instructing him to give his opinion on certain points in connection with the scheme prepared by Mr. Kidd.

A.—I have that here.

Q.—Your telegram of the 26th shows that he was already engaged on the work. Does your recollection enable you to say about how long he had been engaged then?

A.—I am afraid I do not remember. I do not think long, but I am afraid I do not remember exactly at this length of time. I may be able to turn it up for you.

Q.—Do not trouble about it.

A.—I do not, as a matter of fact, recollect it at this moment.

Sir Frederick Hopkinson.—I should like it if you could do that.

A.—Perhaps you would remember, as regards details, the difference between the Governor and a member of Council in this matter. One does not necessarily come across every detail in these matters. That is left to the member in charge of the Department.

Mr. Billimoria.—If your Excellency would give us some idea of the length of time he was engaged on the job that would be very important.

A.—I could not tell you.

Chairman.—I think it will be found it was on the 7th May, 1919, that the Government of Bombay told Sir George Buchanan that they wanted his services. I think we can fix it beyond doubt that Sir George Buchanan arrived in Bombay on the 19th May and had certainly left by the 6th June.

Sir Frederick Hopkinson.—He left on the 30th of May.

Chairman.—I was saying he had certainly left by the 6th June. There is some correspondence which shows it.

A.—My note that I have prepared merely says : " Finally in May the Government of Bombay decided to employ Sir George Buchanan." I cannot get it beyond that at present.

Q.—Do you remember whether you had any, and what, interview with Sir George Buchanan before he went off to England to make further enquiries with regard to dredging plant and material?

A.—Perhaps it would be convenient if I told the Committee the note I had made in preparation for your question here, which is all the information that I think I can give you without trying to find more.

Q.—Please do.

A.—As you have pointed out, the position when I arrived in India was that my predecessor, Lord Willingdon, informed the Secretary of State in October, 1918, that a re-examination of the Back Bay Reclamation Scheme was a matter of special urgency, and had requested him to obtain the best qualified man available—someone entirely independent of the competing syndicates. In April, 1919, my Government pressed the Secretary of State to send out a man before the monsoon of that year, 1919—I think that you know that already—to avoid losing the whole year's work. My Government also informed the Secretary of State that if an expert were not shortly available from England, the Bombay Government would agree to use the services of Sir George Buchanan. The Secretary of State was unable to secure at the time the services of an engineer in England, and finally in May—that is the only date that I have got that I can recollect—the Bombay Government decided to employ Sir George Buchanan to

prepare the report under the terms of reference already known to the Committee. That is all I have about the dates. I cannot, I am afraid, recollect very accurately after a period of six or seven years.

Q.—We fix the date in this way. We have got a letter from Mr. Mackie to Mr. Ewbank.

A.—Mr. Mackie is Secretary to Government in the Development Department at present.

Q.—" I find a Minute recorded by Sir George Carmichael dated 13th May, 1919, stating ' Please have the papers ready against the 20th instant, when Sir George Buchanan expects to come to Bombay.' " That is the 20th May?

A.—That seems to fix the date.

Q.—There is also a telegram from Sir George Buchanan wherein he stated he would arrive in Bombay on Monday the 19th May.

A.—I am perfectly prepared to accept your dates. I cannot possibly recollect.

Q.—Then there is a Minute of Sir George Curtis dated the 6th June, in which he says: " I did not realise that Sir George Buchanan had taken away the file of the correspondence. We shall have to wait till Sir George Buchanan returns." So that fixes it definitely that he was in Bombay on the 20th and had certainly left by the 6th June. We know from another source also that he left on the 31st May. In those 11 days, from the 20th May to the 31st May, did you have any interviews with Sir George Buchanan?

A.—Yes, to the best of my recollection I had one or two. I cannot remember how many or what dates.

Q.—This question of the proposed reclamation of Back Bay was a most important matter. Did Sir George Buchanan have any interviews with your Ministers when you were present, between the 20th May and the 31st May?

A.—There were no Ministers at that time to be technically accurate. There were Members of Council.

Q.—I am sorry—that is before the Reforms?

A.—I saw before and after———

Q.—Members of Council.

A.—Yes—I have not the slightest doubt, though I cannot absolutely prove it, that he had interviews with the Member in Charge, who would be Sir George Curtis, and probably with Sir George Carmichael, but I cannot say.

Q.—It would appear so from that letter?

A.—I am perfectly confident that he had them with Sir George Curtis, and I imagine that he had them with Sir George Carmichael.

Q.—But not any meeting at which you presided with the Members of the Council?

A.—No formal meeting at that time—I do not think so.

Q.—Between the 20th May and the 31st May?

A.—It would not be our custom to admit anybody to the Council Meetings.

Q.—I think, perhaps, you have missed the point of my question. My question was this. It being a scheme of very great magnitude, what I was wondering was whether you, having consulted Sir George Buchanan, asked other Members of the Council informally to come and discuss it?

A.—Most certainly I discussed it with them, but I cannot recollect in what form or whether we were three together or four together at any particular time.

Q.—Would that be before the 31st May, when Sir George Buchanan left?

A.—I should think certainly, but I can recollect no dates particularly.

Q.—At that time Sir George Buchanan could necessarily have had only a very vague idea of what he would have to report on?

A.—I cannot say as to that.

Q.—He had only 11 days?

A.—Yes.

Q.—And then he left India?

A.—I know too little about technical matters to know of how much he could apprise himself in that time.

Sir Frederick Hopkinson.—It depends upon the individual.

A.—It depends upon the individual.

Chairman.—Have you any recollection of the way in which Sir George Buchanan put the matter before you at any date between the 20th May and the 31st May?

A.—No, I have no particular recollection of any particular points that were made. My concern was merely to get an expert appointed—I could not deal with any technical matters myself—and having appointed that expert, to leave him to make his report.

There was no particular object in having a very protracted discussion before he made his report. It was for him to examine the project.

Q.—There is a letter of the 23rd May written by Sir George Buchanan which shows that you had apparently written to him. It begins : " I duly received your Excellency's letter dated the 20th May."

A.—Is this from Sir George Buchanan to me?

Q.—Yes, to you. " I duly received your Excellency's letter dated 20th May, at which time you had presumably not seen Mr. Curtis since my interview with him." That fixes, as regards Sir George Curtis, that there had been an interview. " I have now gone through all the plans and papers connected with the Back Bay Scheme and have been able to form an idea of the work required. The so-called detailed estimates of Messrs. Lowther & Kidd are very far from complete and the project requires re-casting and re-estimating *ab initio*. So far as the sea wall is concerned there is no engineering difficulty, and I know exactly the strength of work required to resist wave action in the south-west monsoon, but, as I thought would be the case, the crux of the whole scheme lies in the provision and successful working of the dredger or dredgers. I shall have, in another week's time, all the information I can get in Bombay, and I am strongly of opinion, in which I believe Mr. Curtis and Mr. Kent concur, that the sooner I get home and tackle the dredging problem with the builders the sooner you will be able to decide on the best action to take in the execution of the work. I naturally do not wish to go home if your Excellency has other matters in which my advice can be useful, but unless they are of great urgency I suggest I might take them up on my return to Bombay in a few months' time. The proposal I intend placing before you when I have received the Terms of Reference is that I should go home on the 31st May and, having prepared specifications for the dredging plant I consider most suitable for the work, and having obtained full particulars and prices, I should return to Bombay with the whole scheme and estimate ready for consideration by your Government. I would also suggest an inclusive fee to cover all my expenses as well as professional services," and then details of the fees are given. " In the matter of dredgers, the best in the world are made by one or other of four firms in the Clyde district. Some years ago I made a tour of Canada and the United States, in the course of which I inspected myself all the large dredging plant there from the River St. Lawrence to New Orleans on the Mississippi, but I found nothing which came up to our home work. The War may have altered matters, and it is just possible I may find we can do better both as regards price and delivery in America." Therefore, in that letter, at all events, Sir George Buchanan was not binding himself down to any one particular firm of dredger builders?

A.—It would not appear so.

Q.—Indeed, he was not binding himself down to the Clyde district, but also was proposing to investigate the conditions in America. On the 25th May you replied: " My dear Sir George, thank you for your letter of 23rd May, I should wish to leave the date of your departure entirely to your own discretion, and if you think the Inquiry and final report which I am asking you to undertake will be hastened rather than delayed by your getting to England at once, please make your plans accordingly. All I am anxious for is to know as early as possible whether the Back Bay Scheme is feasible, and on present prices, is a desirable enterprise, if not, to abandon it finally and turn our energies into other directions, or if it is found practicable, to get on with the job without another 10 days' discussion. I shall hope to see you on Wednesday next and discuss the matter fully with you." That represented, I assume, your position on 25th May?

A.—Presumably.

Q.—You wished expert advice on two points : whether the scheme was feasible, secondly, whether on present prices it was a desirable enterprise : and then you wanted it hastened on without undue discussion. Going back for a moment to the phrase : " Whom the Government of India recommend," that is Sir George Buchanan is the person recommended, may I ask you this? Sir Claude Hill was not an engineering expert?

A.—I should think not.

Q.—His adviser, we know, was Sir Sydney Crookshank. Do you happen to know whether Sir George Buchanan had done any other work for the Government of India?

A.—Yes, I think he certainly had. My knowledge of Sir George Buchanan was that he had carried to a very successful conclusion a large river draining scheme in Rangoon, and I think it was for that that he received his knighthood, showing the appreciation of the Government of India for the work done. He had successfully re-organised the Port of Basra during the War. I said " successfully " advisedly—because I understand he was thanked by the Government of India also for that work—and had been responsible for dredging operations and considerable reclamation in Mesopotamia. For those services I am told he received the K.C.I.E. He had had large experience with dredgers and in dredging. He knew the conditions in the Indian monsoon and was

particularly well acquainted with labour and other conditions in India. He seemed, therefore, a particularly suitable person to examine such a project.

Q.—At the time when you sent the telegram of 8th April you were aware of all those facts?

A.—I was certainly aware that he had done very successful work in Rangoon. I knew that he was employed by the Government of India during the War in Basra, though I do not know that I was aware that he had been thanked for his work there or how successful it was, but I had the impression it was successful, and I knew that the Government of India, from the facts of the case, held him in high esteem.

Q.—You say you knew he had received his knighthood for some work in Rangoon?
A.—He was quite well known in India as a man of very considerable experience.

Q.—He had received the K.C.I.E. for work in Mesopotamia?

A.—I understand so. He was very well known in India, and, as I have said, not only was the choice a fairly obvious one, but it had the approval of the Government of India who were in a position to know about him.

Q.—Sir George Buchanan having left India on the 31st May had completed his report by the month of Septemebr, 1919, and handed it to the Government of Bombay in October, 1919. Having considered that report your Government wrote the letter of the 4th December, 1919, which you will find at page 10 of the History of the Scheme. You had acquainted yourself with Mr. Kidd's report of 1912?

A.—Yes.

Q.—That was the basis indeed on which Sir George Buchanan was asked to report as to the feasibility of the scheme?

A.—Yes.

Q.—Your letter, so far as the extract that we have here, begins: "Sir George Buchanan has now presented his report and I am to say that this Government understand that the Government of India are prepared to accord administrative approval. The Governor in Council does not consider it necessary to discuss the 1912 project again. As pointed out by Sir George Buchanan in paragraph 28 of his report, Messrs. Lowther & Kidd's plans reveal such an unusual absence of detail that it makes an examination of figures extremely difficult from a technical point of view." May I pause there for a moment. Did you compare the figures of Lowther & Kidd's report with those of Sir George Buchanan?

A.—I cannot say what my Member of Council did. I should not do that work personally.

Q.—You would not do it yourself?

A.—I would not do it myself normally. I may or may not.

Q.—Would not you, yourself, as a matter of interest examine Mr. Kidd's report and Sir George Buchanan's report?

A.—Yes, probably I should, but I cannot answer certainly at this length of time, and I should not be competent to decide upon the technical aspects of it. I should read it almost certainly as a matter of administrative duty and interest, but I should not be competent to judge of any technical matter. I cannot say definitely as to what mass of stuff I read at that date, but I take it it is very probable indeed that I did read it.

Q.—Would you take a copy of Sir George Buchanan's Report? (*Same handed.*)
A.—This is the report presented in 1919?

Q.—Yes. I will tell you at once the point I want to put to you. This telegram says: "Messrs. Lowther & Kidd's plans reveal such an unusual absence of detail that it makes an examination of figures extremely difficult from a technical point of view." I am going to put it to you, to see if I can obtain your concurrence, that in point of fact that criticism applies. and must apply, with almost equal force to the report of Sir George Buchanan. I just want to take you through it, and it will not take more than two minutes. Will you look at page 13? This is a document that must have come under your observation and your close attention. Take Table A and Table B. Table A is one of the parts of Mr. Kidd's report which is criticised as showing an unusual absence of detail. Table B, I think if you will run your eye down it, has the same absence of detail

A.—I am afraid I am not in a position to say what is considered detail and what is not from the technical point of view

Q.—You are in a position to answer this. If Table A contains an unusual absence of detail is not there the same absence of detail in Table B?

A.—I must just look for a moment and compare it.

Q.—Please do.

A.—I do not recollect this, but it would appear to be very much the same.

Q.—Would you kindly pass on to page 29? There you get Sir George Buchanan's revised estimate of the cost of the scheme, which he works out there as 367·61 lakhs.

A.—Yes.

Q.—Without having any technical knowledge does not that revised estimate of the cost of the scheme seem to be rather in a skeleton form?

A.—I really could not say, I am afraid. I would answer it if I could, but I am afraid I cannot answer. It is too technical for me.

Q.—Does it appear to you to have an absence of detail?

A.—I am afraid I really cannot answer that question because on technical matters of this kind I do not know what is detail. That I have to leave to others.

Q.—This puzzles me a little. I am only asking you because here is the telegram sent by the Government of Bombay on page 10, which I have just referred to. Someone who drafted that telegram said that: "Messrs. Lowther & Kidd's plans reveal such an unusual absence of detail that it makes an examination of figures extremely difficult from a technical point of view."

A.—Yes?

Q.—Somebody, therefore, had noticed that with regard to Lowther & Kidd's plans?

A.—Yes?

Q.—If you had compared Lowther & Kidd's figures with those of Sir George Buchanan do not you think that you also would have agreed that Sir George Buchanan's figures showed an absence of detail?

A.—They appear to be very much the same.

Q.—I am not at all putting it forward by way of criticism because there was a necessity to get out the figures as quickly as could be. That is right, is it not?

A.—Yes; the whole matter was to be dealt with in an urgent manner.

Q.—There was a need for haste. Even if there was an absence of detail, if the figures ultimately proved correct no one could complain of the absence of detail. Now I will continue with the telegram on page 10: "In the circumstances the Governor in Council proposes to discard this scheme entirely"—that is, Mr. Kidd's scheme—"and to concentrate attention solely upon Sir George Buchanan's own scheme, which includes the same area as that covered by the 1912 project, namely, 1,145 acres. On the technical aspect of the new scheme the Governor in Council offers no opinion. He is fully prepared to accept Sir George Buchanan's carefully considered views on the practicability of the scheme from the engineering point of view, on the type of wall required for the reclamation and on the method of reclamation." Having stated in the letter that your Excellency offers no opinion on the technical aspect of the scheme, did you obtain advice on Sir George Buchanan's scheme from any of your advisers—from any member of the Public Works Department?

A.—I certainly discussed it with my colleagues in general.

Q.—When you say your colleagues, whom do you mean?

A.—My colleagues are generally referred to as my Cabinet colleagues.

Q.—None of your Cabinet colleagues would have offered any opinion on the technical aspects of the scheme?

A.—I should think not.

Q.—So that there was no one immediately round you, no member of the Council who had any experience, or who could give any opinion of value on the technical aspect?

A.—No.

Q.—Did you consult any outside source, such as the officers of the Public Works Department?

A.—I certainly consulted the late Mr. Kent who, when I first went to India was the head of the Public Works Department. If Mr. Kent was Secretary for any appreciable time after the receipt of Sir George Buchanan's report, the report would certainly have been discussed by me, or by a member of my Council, or by both of us with him; but I cannot remember exactly who was the Secretary of the Public Works Department at that particular period. Perhaps Mr. Ewbank could tell me.

Q.—Mr. Ewbank shows me a letter, which I am quoting from, and that shows that it was sent from the General Department, from Mr. G. A. Thomas.

A.—Yes; that is the letter of the 4th December.

Q.—Yes; have you any recollection of having discussed this matter in its technical aspect with Mr. Kent?

A.—I certainly have a recollection of discussing it with the head of the Public Works Department—that was the scheme before that period. I remember that early on in the spring. Whether I discussed it with Mr. Kent, if he was there afterwards, I cannot remember. The normal course would be that the Secretary of the Public Works Department would come in on his ordinary days, or if there was pressure, on additional days;

and all matter which were relative to his Department would be discussed which he brought before me. A matter of this kind, I should think it would be perfectly certain I discussed with the Secretary of the Public Works Department.

Sir Frederick Hopkinson.—You said in the spring, but the report did not come till the autumn.

A.—I made that point particularly. When I am speaking of Mr. Kent, I certainly discussed the general scheme with him in the spring. I know he was there then. I cannot recollect at this moment when Mr. Kent left, unless Mr. Ewbank can tell me.

Mr. Ewbank.—I do not remember the exact date. He was certainly there in 1918.

Chairman.—There is a letter of the 9th December, 1918, from Mr. Kent.

A.—He was there, I know, for some little time after I was there, and I have that recollection of discussing it with him; but I cannot remember what period, which is what you are trying to ascertain, is it not?

Q.—What I am trying to ascertain is: when you had read this report and were considering what action was to be taken on it, and were considering the terms of your letter to the Government of India, which is the letter which says on the technical aspect of the new scheme, the Governor in Council offers no opinion, did you seek the opinion of any outside person who could really give you a technical opinion of value?

A.—Well, I have given you the best answer I can give. I can only speak generally; that is to say, in the normal course of events I should certainly have discussed it. As far as I know, I did discuss it. I cannot recollect about who was there at the time, and that rather blurs my recollection. Let me speak rather more generally at the moment. On the technical aspect of the scheme I fully accepted Sir George Buchanan's view. You quite understand that the scheme was not a new one. It had been long under everybodys' consideration. A complete report and estimates had been obtained from one expert, and Sir George Buchanan had been called upon to give a second opinion. That was the position. You must end with taking expert opinion at some time. If you are ill and you go to consult a specialist in Harley Street you do not improve matters by going to another specialist on top of it. The end must come some time. It had been going on for some time—18 years.

Sir Frederick Hopkinson.—Sometimes there is no time to go to another expert?

A.—That is not what I intended to say.

Q.—The end comes?

A.—Yes.

Chairman.—It is not quite analogous, perhaps.

A.—The engagement of experts to report on schemes of their predecessors must terminate at some time, especially when the evil is grave. At the end of 1919, after the receipt of Sir George Buchanan's report, the time was ripe for decision. I want to make the general position clear. The work was outside the experience of the Public Works Department. I am sure you will agree on that. For that very reason the reports of two independent experts had been obtained. We had taken every possible precaution in that way. No further enquiries were made from independent engineers except in the ordinary course of my duties. To what degree I discussed the matter with Mr. Kent or another I cannot at this juncture recollect. There were changes, as I say, in the Public Works Department about that period, but if Mr. Kent was Secretary for any appreciable time after the receipt of Sir George Buchanan's report, the report was very probably and almost certainly discussed with him. It was also open—I draw your attention to that fact—to the scrutiny of the technical advisers of the Government of India as well as that of the Secretary of State, who did not have supervising powers for nothing over the Presidency Government; and they had those powers and were bound to use them.

Q.—I think you have answered the question I have put to you. Was there, in fact, anybody in Bombay to whom you could have turned who could have given you an opinion of value on this technical matter?

A.—Better than Sir George Buchanan, you mean?

Q.—Or as good as Sir George Buchanan.

A.—We engaged our expert. I certainly relied on my expert. That is as general an answer and as clear an answer as I can give to you. I think it was the proper thing to do.

Q.—In reading Mr. Kidd's report, and in reading Sir George Buchanan's report, did you notice that there was a discrepancy as regards the description of the clay?

A.—I really cannot say. I should not be very well aware of a point like that. I have noticed in the evidence that there has been a discussion about hard clay and soft clay.

Q.—I put it to you, and I ask you whether such a thing might not have been considered by you as important enough to discuss it with Sir George Buchanan. The

position undoubtedly is this on the documents. Mr. Kidd described the clay as stiff. Sir George Buchanan in his report in one passage describes the clay as hard. When we come to Messrs. William Simons & Co.'s letter of September 12th, 1919, which was appended to the report, we find it indicated that they are going to build a dredger capable of dealing with soft clay?

A.—I am afraid it is impossible for me to help on that. I engaged an expert, and I left the matter to him.

Q.—I think you will be able to help us, because at present I have not put my question; I have only laid the foundation for it. I am putting the matter to you now not as a technical expert but as an ordinary man reading business documents. The clay is described by Mr. Kidd as stiff; it is described by Sir Buchanan as hard, and the dredger builder is talking about soft clay as the material in which his dredger is going to work. Did any one of your advisers point that out to you?

A.—I do not think any adviser of mine pointed it out to me as far as I can recollect, but they would probably point it out to the Member in charge of the Department.

Q.—Did the Member in charge of the Department bring that fact to your notice?

A.—I have no recollection of his doing so.

Q.—There may be nothing in the point, but it is the sort of thing about which a layman might have made some enquiries. You did not?

A.—That would have been the duty of the Member. I take responsibility for all that my officials did. I take full and complete responsibility during my period of office; I wish to make that quite plain. But from the point of view of administration it would have been the duty of the Member in charge of the Department to have dealt with a matter like that.

Q.—Who was the Member in charge of the Department?

A.—Sir George Curtis at that time, to the best of my recollection.

Q.—We have received information from Sir George Curtis that he is extremely ill?

A.—He wrote to tell me so.

Q.—He has furnished us with a medical certificate which shows us that it is practically impossible for him to come and give evidence?

A.—I am afraid he has had a stroke.

Q.—We must accept that, of course. If the matter had been brought to your attention, or if you yourself had noticed it in reading the documents, do not you think you would have discussed it with Sir George Buchanan?

A.—I am afraid that is a very hypothetical question. It would depend on the circumstances. I cannot pronounce on it now.

Q.—If there is anything at all in the point about this description of the clay, it is a striking circumstance, is it not, that the two experts describe the clay, one as stiff and the other as hard, and that the dredger builders were specifying in the plainest terms for a dredger designed to deal with soft clay?

A.—Whether I should have done anything or not would have depended upon my technical capacity to appreciate whether it was an important point or not.

Q.—We are dealing with very simple words in the English language. If you had had any doubt about such a crucial matter as that——

A—But I do not expect that I should have known it was crucial. The whole point depends on whether I was to consider myself as qualified to judge of a technical matter, having appointed my expert; or whether I was to attempt to deal with it myself. I think it was proper to leave it to my technical expert, who had been appointed with full sanction and approval, and to leave him to deal with the matter, and that it was not for me to attempt to deal with it.

Q.—But it would have been within the province of Sir George Curtis to have said to Sir George Buchanan "Look here, will you explain this. I noticed that Messrs. Simons say soft clay. Is their specification quite all right, because you have talked of hard clay and Mr. Kidd has talked of stiff clay." It would have been within Sir George Curtis's province to have done that, would it not?

A.—If he had appreciated the point as a layman, I think it would have been. It depends upon whether he did appreciate the point or whether he did not. I am afraid I do not arrogate to myself such knowledge as you are good enough to impute to me.

Q.—It was on the documents. Anybody could see it reading the documents. The explanation may be a technical matter, but I suggest it is a thing which would strike any business man—the essence of the scheme being the successful dredging, and one expert, Mr. Kidd, talking of it as stiff clay, and Sir George Buchanan talking of it as hard clay, and then the dredger builders, who are going to make the one machine upon which the whole success of the reclamation may depend, talking in terms of soft clay. Without having any technical knowledge, do not you think that that is a matter which might have struck somebody, either your advisers, or indeed yourself when reading it?

A.—I am afraid I think that that is a purely technical matter which was proper to leave to the expert.

Sir Frederick Hopkinson.—Is not everyone an expert in digging clay? If you have ever handled a shovel surely you know what is the difference between hard clay and soft clay?

A.—I have only handled a coal shovel on a ship. I have not handled a clay shovel, so I am even more ignorant about shovels than I ought to be.

Chairman.—I am going to get away from these details in a moment, but I was referring you a short time ago to Page 29 of the report of Sir George Buchanan. Sir George Buchanan speaks of dredging to the extent of 25,000,000 cubic yards. It is item No. 7—" Filling, mud cubic yards 25,000,000 at eight annas per cubic yard; cost, 125 lakhs." That is the item. I am not suggesting, Your Excellency, that you might have worked the figure out, but did no one advise you in your office—either the Public Works Department or anybody in association with Sir George Curtis—that the dredging plant was going to cost at that moment about £650,000? Was that figure ever mentioned?

A.—I think I knew roughly the price—the probable cost of the dredger.

Q.—650,000?

A.—Yes, I think I knew roughly that it was that kind of cost. I do not remember the actual figure.* I knew it was a very formidable cost, and that it was round about that figure.

Q.—If anybody had been interested enough to have worked out the cost of the dredging plant at £655,000, and had ascertained that 125 lakhs was some £937,000,† they would have found out that it would have left only £282,000 for the working of the dredger and booster, the two shifts or the three shifts, the crew, the reconditioning of the vessels, and everything for a period of five years. I am not suggesting that you should have worked it out, but if anybody had worked it out might it not have struck you, if the figures had been laid before you, that they represented a somewhat insufficient provision?

A.—I am afraid I cannot answer that without notice. You did not call my attention to that, Mr. Chairman. There again it is purely a technical matter. I repeat that I placed my confidence in Sir George Buchanan as the expert. I am afraid I cannot add to that in regard to the matter. I think it was the proper course to take, and we followed that course.

Q.—The letter continues : " He is fully prepared to accept Sir George Buchanan's carefully considered views of the practicability of the scheme from an engineering point of view on the type of wall required for the reclamation and on the method of reclamation." Whilst disclaiming in that letter the offering of any opinion on the technical aspect of the new scheme, did it not occur to you to suggest to the Government of India that it might be desirable that experts at home should consider the documents and reports?

A.—It would not have been my duty to have suggested that to the Government of India or to the Secretary of State. It would have been their business to decide what was necessary to be done in that respect, I should suggest.

Q.—If in this letter you had put in, " On the technical aspect of the new scheme the Governor in Council offers no opinion, but, having regard to the magnitude of the work, he would suggest that it might be advisable to take the opinion of experts in England," the Government of India would not have resented a suggestion of that kind, would they?

A.—I have already tried to point out that there has to be some limit to the consultation of experts as far as the Government of Bombay is concerned. Having appointed the expert with the full authority, knowledge and approval of the superior authority, the matter had to end there as far as I was concerned.

Q.—You make your position perfectly clear.

A.—It was for a higher authority to go into that.

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* Lord Lloyd has subsequently pointed out that Sir George Buchanan allowed roughly 3 annas per cubic yard for plant (47 lakhs) and 5 annas for working expenses (78 lakhs) and that the point for consideration is whether 47 lakhs was sufficient under the exchange conditions of that time to cover the sterling value of the plant.

† Lord Lloyd has subsequently pointed out that the estimates were considered in Bombay in terms of rupees. Sir George Buchanan made this conversion at the rate £1 = Rs. 12 which was a perfectly safe rate at the time. In October 1919, the exchange was £1 = Rs. 10, and it was always still more favourable to sterling purchases up to the date of the sanction of the Secretary of State. Further it was the declared policy of the Secretary of State to stabilize the rupee at 2s. gold.

Q.—I understand your position perfectly. Did Sir George Buchanan ever tell you, before 3rd August, 1920 (that is the date when you made the announcement in the Legislative Council of the creation of the Development Directorate)——

A.—May I ask which of the three questions, of which you have given me notice, you are on now? Then I will get my notes. I am not quite clear where we are.

Q.—Did Sir George Buchanan ever tell you at any time before 3rd August, 1920, that the success of the scheme depended a great deal on the nature of the material dredged, and that that could only be ascertained when actual dredging began?

A.—I cannot remember his having done so or his not having done so. I have no recollection of any such conversation. Perhaps you will refresh my memory.

Q.—I must discuss this with you. Sir George Buchanan made a report in 1922, on the 11th February, and in that report, on page 8, the fifth line, he says: "Much depends on the nature of the material dredged, and that can only be definitely ascertained when actual dredging begins." I want your recollection on this matter. Did Sir George Buchanan at any time before you left Bombay ever tell you that a great deal depended on the nature of the material to be dredged, and that that could only be ascertained when the actual dredging began?

A.—I do not recollect any such conversation or any such information.

Q.—You could not have forgotten that, could you?

A.—I do not think so.

Q.—If you had known——

A.—Let me interpose here. Of course, I knew that you had to have a proper material to dredge. I obviously knew that, but I do not recollect any conversation.

Sir Frederick Hopkinson.—You had to dredge whatever material was there?

A.—Precisely, and if that material was not there it would obviously prevent the scheme being successful. That, of course, I knew, but I do not recollect any conversation with Sir George Buchanan on the actual point to which you have referred me.

Chairman.—If such a conversation had taken place you must have followed it up, must you not, and have said: "Well, we must find out with certainty of what the bed of the sea consists"?

A.—Yes, but I had understood that examinations had been fully made before.

Q.—You are aware, as regards that, that he depended entirely on Mr. Kidd's borings?

A.—Yes.

Q.—Sir George Buchanan disclaimed definitely in his report any responsibility for that, saying that he was relying on and assuming the correctness of Mr. Kidd's borings?

A.—I believe that is so, and I believe that Lord Sydenham's Government were completely satisfied with the work done by Mr. Kidd in that respect. Lord Sydenham was an engineer himself, and spoke, perhaps, with unusual authority for a Governor.

Q.—But whatever Sir George Buchanan put into the report, your recollection is that he never at any time told you that the nature of the material could only be definitely ascertained when the actual dredging began?

A.—I do not recollect that he ever did.

Q.—It gives it somewhat the air of an experiment, does it not?

A.—I really cannot answer that. I can only repeat what I have just said to you—that my understanding always was that Sir George Buchanan was relying upon Mr. Kidd's borings for the nature of the material which he was going to find when he dredged. I think that is accurate.

Q.—Did Sir George Buchanan ever tell you that the first season's working would be experimental?

A.—I have no recollection of it. You must remember it is six years ago. A good deal has happened since then. He may have said so or not, to Sir George Curtis. I cannot say.

Q.—You had before you a report which suggests nothing of an experimental character; that is, the report of Sir George Buchanan, in which he said that the dredging would proceed from the first year to the last year at the rate of 170 working days, pumping 15 working hours, and dredging at the rate of 2,000 cubic yards an hour. That was a definite document and a definite statement. Did he ever qualify that to you by telling you that the first season's work would be experimental?

A.—I do not recollect any such statement at all.

Q.—You could not have forgotten it?

A.—No, I do not think so. I say that I do not recollect any such statement. I am trying to answer to the best of my ability. I cannot guarantee anything at this stage of time. I think I should certainly have remembered such a statement if it had been

made, or made in any important way at any rate, especially if he had told me as a warning or anything of that kind.

Q.—Did he tell you that good dredging masters were rather difficult men to get hold of?

A.—I really cannot remember.

Q.—Did he discuss with you the loss of time that there would be each day—any of those details?

A.—No, certainly not that. I have a vague recollection once of talking to him about the kind of crew which he had got for the dredger. I asked that as a matter of interest, and I think I was told that they were a Glasgow crew, but certainly not the latter point.

Q.—Nothing to suggest to you difficulties which might greatly diminish the output?

A.—Not at all. I understood that the dredging was a straightforward matter, provided you got the right kind of dredger and that the material was there, which I understood was there.

Q.—Will you please turn to page 6 of Sir George Buchanan's report, the eighth line, where it is stated: " In Mr. Porter's letter under reply, it is stated that experience of reclamation by suction dredging is limited in Bombay. I am therefore to point out " —and this is the passage to which I want to direct your attention—" that the large reclamations being carried out by the Port Trust afford exceptionallly complete data for estimating work of this kind." I want to get the position. The position was that Sir George Buchanan was drafting a report to be considered by the Government of Bombay as to whether they should embark on this very large scheme, which, in any event, even on his own show, was running into over £2,000,000. Does not the inclusion of the phrase, " I am therefore to point out that the large reclamations being carried out by the Port Trust afford exceptionally complete data for estimating work of this kind," imply to your mind, when you read it, that the data were satisfactory?

A.—The Port Trust data?

Q.—Yes?

A.—Certainly.

Q.—Obviously; and not only that, but that Sir George Buchanan was acquainted with the exceptionally complete data. He is there pointing it out?

A.—Let me read it again. I think that would follow, but I must read the context for a moment.

Q.—The position is this. Mr. Porter was raising a doubt as to whether it was a wise thing to do this reclamation.

A.—Who is Mr. Porter?

Q.—He must have been a Secretary, I think.

A.—Not in my Government?

Q.—No, the Government of India. He was casting doubt as to whether it was wise to do this reclamation by means of dredging, because the experience of the employment of suction dredgers on a large scale was limited, and reclamations on a large scale were limited. That is the context. Then the writer of the letter rebuts that by saying: " I am therefore to point out that the large reclamations being carried out by the Port Trust afford exceptionally complete data for estimating work of this kind."

A.—Yes. Then I should concur in your view which you expressed in your question.

Q.—It was a heartening statement?

A.—I think so.

Q.—At that date I assume you did not know what the Port Trust dredgers had been doing? You would not know?

A.—That was at what date?

Q.—November, 1919.

A.—No, I should not think I knew. I knew that, on the whole, the Sewri Reclamations were being very successful, and I gave some figures in a public speech which I made at the Indian Merchants' Chamber, I think, in which I quoted the accuracy of the Sewri Reclamation returns.

Q.—I hope you did not give the figures of the performances of the " Kalu " and " Jinga," to which I am coming, because they present rather a different aspect?

A.—I have those figures somewhere, I think.

Q.—I will give them to you now. You may take this as a fact, from the documents which have been given to us—that the " Kalu " and " Jinga " were the two dredgers which are indicated in this statement incorporated in Sir George Buchanan's report. I think there will be no doubt about that.

A.—I should be grateful if you told me which broad question you are asking me about now, so that I can turn up my notes. Is it possible?

Q.—I think for the moment that I have perhaps gone a little away from the broad questions.

A.—I have something about those dredgers here which occurred on another question. I will try to find them.

Q.—My question is very simple, and can be answered in a moment. You may take it that it has been satisfactorily proved to us, and that it is not a matter of controversy, that the " Kalu " and " Jinga " were each designed to dredge 2,000 cubic yards an hour?

A.—I cannot say.

Q.—I am asking you to take that from me as a matter not in contest or controversy at all. I am also asking you to take it again as a matter beyond controversy that, according to the figures, instead of those two dredgers dredging 2,000 cubic yards an hour in the whole of their four or five years' work, they averaged 1,126 cubic yards an hour. That is roughly 50 per cent. If you had been told the " Kalu " and " Jinga " had been built by Messrs. Simons, that Messrs. Simons were the proposed builders of the new dredger, that over the four years during which those dredgers had been working they had done about 50 per cent. of their guaranteed output, would not that have struck you as a serious matter for consideration?

A.—I presume it would, certainly.

Q.—And as a matter hardly borne out by the statement on page 6, lines 10 and 12?

A.—I am afraid I cannot add to my previous reply. That would seem to me to be certainly a heartening question, to use your own phrase.

Q.—Take it that that seems to be a heartening assertion. The performances of the " Kalu " and " Jinga " were disheartening, were they not, on that basis of 1,126 cubic yards per hour?

A.—Certainly disheartening in total result. Whether it was due to the crew, or to the management or to the engineering, I cannot say. I am taking your figures. I do not know about them.

Q.—Now I am coming to another point altogether, with regard to Sir Lawless Hepper.

A.—You are coming to the appointment of Sir Lawless Hepper, are you?

Q.—Yes. With regard to Sir Lawless Hepper, you had preliminary discussions with him, he says, in about December, 1919 or 1920?

A.—He would know. I do not recollect. I am sure he would be accurate about it.

Q.—He was at that time in a very important position as Agent of the G.I.P. Railway?

A.—That is right.

Q.—A position needing considerable organising ability, in control of a very large number of men, and a position carrying a very handsome salary?

A.—I cannot say what you consider a handsome salary. He was in a very important position.

Q.—According to him you discussed the question of salary and he made his own conditions?

A.—He had a very good salary.

Q.—He has disclaimed any suggestion that he was employed because of any technical knowledge. What do you say as to that?

A.—I should not agree in those terms. Sir Lawless Hepper, if he had not been an engineer and not had various other qualifications which seemed necessary for the task to which he was going to be put, probably would not have been appointed, speaking in general. Sir Lawless Hepper was selected as Director of Development because the success of the development scheme depended, to a very great extent, on the capacity of whoever was appointed at the head. The work, as you know, was of a very exceptional character, and its operations were on a very large scale. We had to combine in our Director a great many different qualities. It was necessary that the Director first of all should have a very close acquaintance with local conditions. We might have got somebody from America or from a great distance, but it would have taken him two or three years in which to learn the local conditions. It was therefore considered important that we should get a man who already knew the local conditions. It was very important that he should understand traction and transit problems, because the whole of that island problem (not the whole of it, but a large part of it) is a traction problem. He had these two qualifications in a very high degree. He knew the place intimately He was acquainted with the traction problem, as you have just pointed out. He had had a distinguished career as a railway engineer, and he was then holding a very important post on a railway, as you have also pointed out. He had been further proved during the war by his work as the Local Controller of Munitions, and he stood, I think I can say, exceptionally high in the estimation of the Government of India, and,

what was also of great importance, he stood very high in the estimation of the public of Bombay. We had to raise public loans, and it was very important that the Director of these works should have the confidence of the public from whom we were asking money. The local public, in a narrower sense, had great confidence in him. As a railway agent, as member of the Port Trust and City Improvement Trust, he was very well acquainted with all the local conditions, and, combining those four qualifications, he seemed to be almost unique in experience for that particular post. Those were the considerations which led to his appointment. Therefore, to some extent, his engineering, in a general sense, was a qualification—not very specific.

Q.—I think, perhaps, Sir Lawless Hepper was limiting his answer to the particular problems which the Back Bay reclamation presented when he disclaimed any technical knowledge of those problems. Who was the person, or firm, responsible for the carrying out of the works?

A.—I am afraid I do not quite follow you.

Q.—Was Sir Lawless Hepper the person responsible for the carrying out of the works in Back Bay, or were Messrs. Meik & Buchanan, or Sir George Buchanan, responsible for it?

A.—That is not a question to which can be answered yes, or no. You have taken a great deal of evidence on this question, and perhaps it would be better if I described to you what were his functions.

Q.—The functions of Sir Lawless Hepper?

A.—Yes.

Q.—If you please; that is what we want to get at really.

A.—I do not know if this Committee thoroughly appreciates, for instance, the Department over which he presided, and its constitution and organisation. I think that should be quite clear in your minds, if I may make it so.

Q.—Will you please tell us the organisation of the Development Directorate, and then, if you please, tell us with regard to Sir Lawless Hepper's special position?

A.—I will do my best. In describing the duties of Sir Lawless Hepper, and his relations to the local Government, it is necessary to distinguish between the Secretariat Department and the Executive Organisation, since the term "Development Department," I notice, has been used to cover both. The Secretariat Department, for any activity of Government, is the organisation which deals with the business which comes before Government and through which they issue their orders. I think that is natural and plain. The Secretary is the principal of the Department, responsible to Government for the conduct of business and for the issue of their orders. He is the channel; but the Secretary as such (and anyone familiar with the organisation in India will know it) has no executive powers. The Executive is usually a separate organisation presided over by a separate officer, often known as the head of the Department. In this case which we are discussing the Executive Department was known as the Development Directorate, and its head is the Director. I can give you a suitable analogy in the case of Public Instruction in India. There is a Secretary to Government for Education, who is the channel through which Government deals with education, and the executive head of the Department is the Director of Public Instruction. I hope I have made the position clear. The Secretary to Government in the Development Department was also the deputy of the Director in the Executive Department. Is that quite plain?

Sir Frederick Hopkinson.—It is perfectly clear to me.

A.—Sir Lawless Hepper's relations to the local Government, generally speaking, are the same as those of the head of any other Department. Any difference was largely in the exercise of discretion. In the Back Bay Reclamation Scheme his functions were qualified by the agreement with Meik & Buchanan, who ultimately became responsible for performing the work and duties set forth in that agreement. I need not recite the terms of the agreement, because they are before you. Messrs. Meik & Buchanan designed the works, and the Director was responsible to Government for ensuring that the works were carried out according to the firm's designs by the chief engineer. The programme of work was set forth from time to time by Sir George Buchanan. The relations of Sir George Buchanan and Sir Lawless Hepper to Government might be described in general terms by saying that the former was responsible for the strategy, and the latter for the tactics, of the scheme. The Director was responsible, for example, for organising the staff, though the principal appointments required the orders of Government, while the chief engineer's appointment was subject to the nomination of Sir George Buchanan. These were not watertight compartments, and that is the difficulty of answering your question absolutely precisely. In no great organisation can it be so. The staff recruited in England was engaged by the India Office or by the High Commissioner's Office, and the selections were usually made on the recommendation of Sir George Buchanan. The Director was also largely responsible for obtaining plant accord-

ing to the plans and specifications of Sir George Buchanan. He was the Government watch-dog. That was his main function. It was his duty to see that the organisation was working efficiently and economically. Any departure from the technical proposals of Sir George Buchanan or any proposed action in disagreement with the latter, would have been referred, presumably, to Government for their orders. That is about as precisely as I can give you the relations between Sir George Buchanan and the Director of the Development Department. Does that in any way answer your question?

Chairman.—Yes. On that I might base a question at once. Take your last passage. Suppose Sir George Buchanan had indicated that a pipe-line should be laid along a certain course in Bombay, and suppose Sir Lawless Hepper had thought another position would be more convenient? Whose decision would have been adopted—the engineer's or Sir Lawless Hepper's?

A.—It is rather a hard question to answer, put in that form. It is hypothetical and it requires a good deal of thought. It depends on a good many things. In my judgment, it would depend very much on the importance of the change proposed. Sir George Buchanan's general designs and plans had to be adhered to. He was responsible. In all tactics that were in accordance with the strategy laid down by Sir George Buchanan, I should say that, generally speaking, the Director was responsible.

Q.—But suppose Sir George Buchanan cabled out, " Pipe-line is to be laid along such-and-such a point," was not that decisive as to where the pipe-line was to be laid?

A.—I should think so.

Q.—What had Sir Lawless Hepper to say to that?

A.—I should say he had to fall in with Sir George Buchanan's instructions if they were definite and of anything like major importance. I am speaking generally.

Q. I wanted to get your view of an instance such as that. Will you continue?

A.—That is all I have to say in general explanation.

Q.—Now I want to take you to two statements, one made by Sir Leslie Hudson, as representing the Chamber of Commerce. It is on page 145, 952.

A.—Have you done with the organisation of the Development Department for the moment.

Q.—Is there any other matter with regard to the Development Department on which you can help us at all?

A.—I do not think there is. Perhaps you will let me look through it at the end. This is the point about Sir Leslie Hudson's statement, is it?

Q.—Yes. Sir Leslie Hudson's statement was given on the 12th August. The statement is headed: " Written statement of the attitude of the Bombay Chamber of Commerce towards the Back Bay scheme." Sir Leslie Hudson was giving evidence in a representative capacity. The Bombay Chamber of Commerce say this: " In regard to the past history of the Back Bay reclamation, the points which the Committee desire to emphasise are, the wholesome practice of consulting commercial opinion was departed from; the scheme was matured and carried out behind a veil of official secrecy." Will you give us your views upon those statements?

A.—I shall be particularly glad to.

Q.—We invite you to do so.

A.—I may summarise the criticisms made by Sir Leslie Hudson into four. The first is that there was no official summary of the scheme—apparently the Industrial Housing Scheme—published before August, 1920.

Q.—That has reference, I think, to a few pages further on. Perhaps I had better read that so as to get it on the note. I have read No. 1 and No. 2, and I will now read No. 3.

A.—The second one was that the representative of Bombay was not supplied with the information for which he asked the Director. The third one, you have just read out—about the wholesome practice of consulting public opinion, and the fourth is that the scheme was matured and carried out behind a veil of official secrecy.

Q.—Those are the four.

A.—In support of criticism No. 4—that the scheme was launched and carried out behind a veil of official secrecy—Sir Leslie Hudson cites criticism No. 2—that the representative of the Bombay Chamber of Commerce on the Advisory Committee of the Development Department was not supplied with the information for which he asked the Director, and also a lecture by Sir George Curtis before the Royal Society of Arts in July, 1921. The passage in the lecture just referred to appears to be the following:—

> " In order to give effect to the proposal to impose a town duty on raw cotton it was necessary to amend the Municipal Act. A Bill for this purpose was introduced in the Legislative Council by the Governor who made a lengthy speech outlining the whole policy of the Government. Owing to the necessity of preventing speculation in land, great secrecy in the plans of Government were essential, and when His Excellency placed the proposal before the Council, it took

both the Council and the public by surprise Accordingly it was decided to start a propaganda explaining exactly what the various projects were . . ."

That is the quotation which suggests secrecy. It depends what you mean by secrecy, to start with. I do not deny for a moment that there was secrecy at the outset regarding some acts necessary to further the development schemes, but I can assure you unhesitatingly that there was no unnecessary secrecy whatever. Secrecy is essential in the initial stages of some actions of executive Government. Such an occasion arises, for instance, when it is proposed to levy fresh taxation. The closest secrecy is observed. It is seldom that Government can proclaim a fiscal intention before its plans are fully matured. It stands to reason. Sir George Curtis's reference to secrecy specially relates to the Bill imposing a town duty on raw cotton imported into the city of Bombay. It could also refer to land acquisition proceedings. No reasonable person who knows the procedure governing the acquisition of land by Government in India expects the Government to proclaim their intentions before their plans are complete and their notifications ready. It would lead to widespread and wholesale speculation, and land speculation has already been the bane of this particular scheme and has added very largely to the housing troubles. It was entirely contrary to public interest to give such information to the public beforehand. Therefore it is not secrecy that is complained of; it is the degree of secrecy and propriety of secrecy. In my speech at the Legislative Council on the 3rd August, 1920, which is the subject of the first part of Sir Leslie Hudson's evidence to which my attention has been drawn, the Committee will find no reference to the financial operations by which the Bombay Government proposed to finance at the outset, not only their own development schemes, but also those of the Municipal Corporation, the Port Trust and the Improvement Trust. Those plans, also, were certainly secret, and essentially and inevitably so. Governments do not announce their plans regarding loans before they are complete and the time is ripe for inviting subscriptions. Those are two instances where I think the Committee will unquestionably agree that secrecy must, in the public interest, be observed. Especially in the matter of loans the Government of India is also concerned, but subject to such considerations of public interest, and, if need be, the prior approval of the Government of India or the Secretary of State, there was no concealment or secrecy of any kind. Most of the development schemes have been for years the subject of investigation by Committees, and of public discussion. They were discussed after my arrival in Bombay, and before they took final shape, with the leading citizens. So far from there being unnecessary concealment, my speech at the meeting of the Legislative Council on the 3rd August, 1920, makes it perfectly clear that the earliest opportunity was taken of explaining the proposals to the Legislative Council and thereafter of giving the widest possible information to the public. It is a matter which the Indian members of the Committee are as well able to judge as I myself, namely, that I have been constantly told that I was considered rather a bore in India, because every speech I made referred to the Development of Bombay. I certainly spoke annually at the Municipal Dinner when they were good enough to invite me. I do not recollect that I ever made a speech without referring very largely to that question. I think Mr. Billimoria will bear me out as regards that. The Legislative Council were fully acquainted with our project and gave it unanimous approval. I doubt whether there has ever been so large a scheme so fully explained which has met with such unanimous approval. Sir Leslie Hudson's second charge is——

Q.—If you are leaving that, I think, as I read it, the criticism of the Bombay Chamber of Commerce is not having taken the public into your confidence prior to the 3rd August, 1920. On the 3rd August you announce the creation of a Development Directorate as an accomplished fact. I think the Chamber of Commerce's view is that it was prior to the 3rd August, 1920, that some indication ought to have been made.

A.—What was the date on which I spoke to the Legislative Council?

Q.—August 3rd, 1920. It is prior to that date.

A.—That is a most undemocratic comment of Sir Leslie Hudson's. I have a regard for him, but I should regard that as an almost frivolous complaint. The right place to discuss projects of Government is the floor of the House, with the representatives there.

Sir M. Visvesvaraya.—The charge is that the public bodies were not consulted.

A.—But they were consulted for years—over and over again.

Chairman.—The public bodies were certainly not consulted with regard to the Back Bay scheme. Consider Back Bay by itself for a moment. There was never any consultation with any of the public bodies, or any general official announcement. The Government have under consideration the reclamation of 1,145 acres of Back Bay, and then a general announcement of the scheme. There was no previous communication. That is what I take to be the complaint.

Sir Frederick Hopkinson.—They were committed to the scheme by the placing of the order for the dredger.

Chairman.—The complaint, which must be dealt with, is that none of the public bodies were told that the Government had in mind this reclamation of Back Bay, and that on August 3rd, 1920, it was announced to them, without their having been previously consulted. It is true that the reclamation had been in the air for 50 years, but this particular scheme came upon them as a surprise. That is the point.

A.—It had been more than in the air. It was public knowledge amongst all these gentlemen as to what was going on. The proper body to consult, and on which they were represented, was the Legislative Council. I am afraid I cannot retire from that position. That is the constitutional and proper body to decide, and they had their representatives there, and they were there consulted, just as the public was.

Mr. Billimoria.—When you went to consult them, it was an accomplished fact?

A.—Nothing is ever finally accomplished until it is properly sanctioned.

Q.—It had been sanctioned?

A.—I am coming to that in one moment. Sir Leslie Hudson's second charge is that the representative of the Bombay Chamber of Commerce on the Advisory Committee was not supplied with information for which he asked. Although the Bombay Chamber of Commerce enumerated this in a written statement as one of the points they desired to emphasise, their representative who appeared in support of the charge of the criticism did not supply this Committee of Enquiry with a precise account of the information they wanted. All I can say on this point is this—that the Bombay Chamber of Commerce never hesitated during my term of office to let me know of any grievances they had; and the fact that this matter was not represented by them to me in some way indicates that either they did not attach importance to it at the time or that the Director was as justified in refusing the request as he was in refusing to discuss the proposal that the reclamation scheme should be abandoned. Moreover, I attended nearly twice the number of times of any of my predecessors the Annual Meeting of the Chamber. Never on any occasion was any complaint made to me. I was constantly accessible to the Chairman of the Chamber of Commerce at any moment, at any hour practically. I never refused an interview to that body, or as far as I know to any other public body of repute. Therefore it is ridiculous to say that if they had any anxieties or preoccupations in regard to this matter they had not ample opportunity of coming to me and asking for information or complaining that they had not had it. It is true that a copy of Sir George Buchanan's report was not sent to the Bombay Chamber of Commerce for their information.

Chairman.—Or to the Indian Merchants' Chamber or to any of the other bodies?

A.—I doubt whether a similar engineering report and estimate was ever issued for public consideration in Bombay. The plain fact is that by the time Sir George Buchanan's report had been received the reclamation of Back Bay had been discussed nearly to a conclusion. Several syndicates were pressing for a concession and the time was ripe for a decision. Government cannot consult and discuss for ever. I have made that point before. These very charges of secrecy and lack of information are partly due to the unnecessarily protracted discussions on other subjects in the Legislative Council. It is not sufficient merely for Government to supply information. It is most desirable that their policy and action should be discussed at the proper place and time. I make that a great point, because I had constitutional duties to carry out, and it was proper that the Legislative Council should be the scene for the approval of the public. The public had to get used to that being the fact in India, especially as the Reforms had come along. As regards the Back Bay scheme, it came under the review of the Legislative Council at least once a year at Budget time, and it could have been raised at the other session; but the House concentrated their attention on other and what appeared to them to be more, but which appeared to me to be rather less, important matters very often.

Sir Frederick Hopkinson.—The charge has been made that those reports of the Development Director which were sent in annually were extremely meagre and did not give a fair representation of the figures and work?

A.—May I just finish what I was going to say about publicity?

Chairman.—The last point you were making was that this matter came up before the Legislative Council.

A.—Yes, at least once a year at Budget time. If they did not choose to discuss it but preferred to discuss what seemed to me to be less important matters, but which appeared to them apparently to be more important questions, it was not the fault of Government. Furthermore, I think you will find it a fact that never, in five years' office, did I ever on a single occasion refuse requests for extra days for debate when it was in my statutory powers to allow them. I have checked my own recollection with that of my Private Secretary, who happens just to have come home, and he agrees with me that on no single occasion did I ever refuse a demand for extra days. Therefore they had ample opportunity of raising this question even in spite of their own desire to talk on other matters at too great a length. I hope the Committee will notice that

point, because these charges which are brought up now of secrecy were not even suggested at the time, or where they were suggested, they were instantly rebutted. If the Bombay Chamber of Commerce were ever seriously dissatisfied in this matter, I never heard it. When I left Bombay this Chamber gave me an unsolicited testimonial—a public expression in no ordinary terms—of their appreciation of my accessibility and readiness to give assistance. I had been to their meetings far more often than my predecessors. I had been very accessible to them. If further evidence of the intention of Government to keep the public informed is wanting, I invite the Committee's attention to the request made by the Indian Merchants' Chamber and to the responses to those requests, particularly to my correspondence with that Chamber in July and August, 1921, and to my speech to them of the 9th August, 1921.

Q.—I am coming to that in a moment.

A.—That speech was made to them in response to public anxiety. I made a special visit to the Indian Merchants' Chamber. When there was public anxiety on the matter I came purposely down from Poona to address the Indian Merchants' Chamber with full publicity.

Q.—Still, the position is prior to August 3rd, 1920. That, I think, is the point?

A.—I think I have answered that in the first part of my reply.

Q.—That the constitutional method and proper place was the Legislative Council, you say?

A.—Yes, certainly. Long before the revised project estimate was settled I gave to the Indian Merchants' Chamber early and full information of the increase which appeared to be inevitable in the estimate, the amount of interest involved, and the consequent financial position of the whole scheme. Looking back, it was perhaps rather a risky thing to do, but at least it absolves me from any charge of concealment from the public. They had the fullest information. I caused my speech on that occasion, and the correspondence, to be published in full in the Press. At the very outset of my Governorship I took another step which was entirely new I started the policy of keeping the public fully informed of all Government actions in a way in which they had never been informed before. It was on my own personal initiative that a Publicity Officer was engaged for the first time by the Government of Bombay. His function was to meet public criticism of this kind and to ensure that Government's explanations were effectively published. Further, on my own initiative, Advisory Members were appointed to the Development Department. Every possible and proper method of keeping the public informed was taken. I should like to take this opportunity, as this criticism has been made, to pay a very high tribute to the admirable work done by our Publicity Officer, Mr. Gennings, in this matter as in others. It is a most unfair criticism of his work as regards keeping the public informed. No public was kept better informed of the progress of a project of this kind than was the Bombay public. In our own interests it was necessary to do so, in as much as the public were interested both financially and administratively in the matter.

Mr. Billimoria.—It has been suggested that the original figure of 367 lakhs, in Sir George Buchanan's estimate, was never mentioned to any public body. The first announcement was with respect to the 702 lakh scheme. The Indian Chamber complained about it very seriously. That was only announced in Your Excellency's speech of the 9th August.

A.—I cannot answer that without notice.

Q.—The complaint is that the figure of 367 lakhs referred to in Sir George Buchanan's estimate was never brought to the notice of any public body?

A.—I think I have dealt with that. I said that a copy of Sir George Buchanan's report was not sent to the Bombay Chamber of Commerce and presumably not to other bodies either for their information. I went on to say that I doubted whether a similar engineering report and estimate was ever issued for public consideration in Bombay. You must remember that there was a great deal of land speculation about. There were grave difficulties in connection with speculation, and the attitude of certain sections of the public had to be taken into consideration. I am prepared to accept as possibly true that that was the case, but I cannot recollect whether that was so or not.

Q.—With regard to that point of speculation, it has been suggested in Bombay that there would have been no speculation, since you were creating more land. Rather than speculation, it would ease matters. The public would have felt that there was more land going to be created, and the speculation would disappear. I am simply mentioning what has been suggested.

A.—I cannot myself easily conceive the conditions under which land speculation will cease in Bombay, so engrained has it been for so long, but I think if any prior

warning and been given of our intention to involve the knowledge of the public in areas of land that were likely to come under notification, that certainly would have increased the speculation very largely. I think you are aware of a case which I have in mind. I do not want to mention any specific cases.

Chairman.—I think Mr. Billimoria may have commercial knowledge of it—certainly I have judicial knowledge of it—the extraordinary value which land attains as soon as it is known that Government wish to have it.

Mr. Billimoria.—Quite so, but what the public feel is that when you are going to reclaim 1,145 acres of land, all that land would come on to the market and the high prices would go down, so that there would not be any speculation. It would be the other way about. It would ease conditions in Bombay and not lead to any speculative tendencies. That is what commercial men are suggesting now?

A.—Those are niceties of opinion which may be right or wrong, and governments are fallible like anybody else. Our desire right through was to give the fullest information possible consistent with our duty and our responsibility. I do not think anybody who has examined the speeches which were made, and the publicity which was given, can really be under any doubt that our desire and practice was to take the public entirely into our confidence.

Sir Frederick Hopkinson.—Before you leave that, may I ask if your publicity officer was responsible for the Development Directorate Annual Report?

Chairman.—He was not. Sir Lawless Hepper said definitely that he was the author of the Development Directorate Reports.

(*Adjourned for a short time.*)

Chairman.—I think you would like to go back to the question of the " Jinga " and " Kalu "?

A.—There is one thing that I could not find before in my notes. I only wanted to say as regards the point that I think you, Mr. Chairman, made about the failure of the " Jinga " and the " Kalu," and the performances of the dredgers for the Sewri scheme, the fact remains that the reclamation was successful, and the actual cost was within 5 annas of the original estimate of Rs. 4.7 per square yard. Whether they failed or succeeded the work was done within 5 annas of the estimated cost. If you want the details, I think in the original estimate it was Rs. 2 per brass for pumping, and in the actual cost it was only Rs. 1.4, which is equivalent to Rs. 5.4 per cubic yard. I memorised these figures the other day, and I had them taken out from my speech to the Indian Merchants Chamber in August, 1921, which information was supplied to me by the Port Trust authorities themselves prior to my making that speech. Therefore I am not concerned with the success or failure as a technical matter, of the " Jinga " or the " Kalu." I only want to say what my knowledge was at the time that the Sewri reclamation had come out within a very, very few annas of the estimated cost.

Q.—When you say " at that time " you mean when you were making your speech on the 9th August, 1921?

A.—Yes.

Q.—On the 3rd August, which was the date when you put the matter before the Legislative Council, you did not know that the " Kalu " and the " Jinga " had done together 1,126 cubic yards per hour instead of 2,000?

A.—Probably not, but I knew at that time in a general manner that the Sewri reclamation returns had been very good and very successful.

Sir Frederick Hopkinson.—Of course the important point in relation to that is that one dealt with 1908, 1909 and 1910, and the future work was beginning in 1920. The element of time comes in, and is there the most important thing?

A.—Of course it is for the Committee to use what I have said in the manner that they think appropriate. I wanted merely to make that point clear.

Chairman.—Have you discussed as fully as you wish the statement of Sir Leslie Hudson to which I referred you?

A.—I think so.

Q.—Then may I call your Excellency's attention to the statement made by Mr. C. N. Wadia of the Millowners' Association. Will you turn to page 303 of the evidence given in India?

A.—Yes.

Q.—You see that Sir M. Visvesvaraya puts the question to Mr. Wadia: " You say in your statement," and then there comes this in inverted commas, " A Government with a well organised cadre of engineers ignoring all ordinary precautions and business methods long and successfully pursued by their predecessors." That was a criticism by the Millowners' Association contained in a statement submitted by Mr. C. N. Wadia,

their representative. " Do you refer to the Public Works Department? (*Mr. Wadia*) : I refer to the procedure generally. Whenever Government in the past has carried out a work of this magnitude they have first of all invited the light of public opinion fully, fairly and at length. When they have had that public opinion they have considered these various opinions tendered to them and then they have estimated the cost and put the work out to tender. Instead of this, the Government conceived a scheme, they bottled it and so we knew nothing about it until they were driven to disclose it in Council." I think in your comments with regard to Sir Leslie Hudson you have covered this matter to a large extent. Is there anything that you would like to add with regard to it?

A.—No. With regard to that reference I do not accept Mr. C. N. Wadia, with all respect to him, as an authority on what the Government has done in the past or does do at present.

Q.—He is a representative of the Millowners' Association?

A.—With whom I had a close connection all the time that I was in India, but even so, I should not accept the Millowners' Association as being at all a good authority on the methods of the Bombay Government or any other Government in India. I prefer my own statement to the Committee to that of any representative outside. I think I am better qualified to know that point.

Sir M. Visvesvaraya.—That is the opinion of another representative besides Sir Leslie Hudson. Several witnesses agree that public opinion was not consulted.

Chairman.—Mr. Ewbank has just told me that although he is printed here on page 13 as coming from the Millowners' Association, the Millowners' Association has written to say that he was not their representative when giving evidence. I have only just heard that. Therefore will you deal with it now as a personal statement by Mr. C. N. Wadia, a business gentleman of very considerable position in Bombay?

A.—But not at all in a position to judge as to what the methods of Government had been in the past, or were at present, nor, I think, qualified, although I have great regard for Mr. Wadia, to express such an opinion as he expressed, especially as he was not careful to be accurate. On what does he base the fact that we were driven to disclose it in Council? Who drove us to disclose it? Nobody could have driven me to disclose it in Council if I had not thought it proper to do so. It was done *proprio motu*, in the ordinary course of public business. He has got no evidence for it. It was done voluntarily by my Government in pursuance of their ordinary method of putting everything possible in the public interest before the public.

Q.—Was the question of the creation of the Development Directorate discussed between yourself and the members of the Government before your speech of the 3rd of August, 1920?

A.—I cannot remember the actual date on which the Development Directorate was set up.

Q.—You may take it that August the 3rd, 1920, was the first date on which it was publicly announced that there was going to be such a body created. Will you accept that? That is in your speech.

A.—I can answer it, perhaps, best in this way, that from the very first moment we began to consider the method of carrying out these works, the composition and organisation of the Development Directorate was a matter of consultation between myself and my colleagues.

Q.—I assume that you would not have made a speech announcing the creation of the Development Directorate unless it had been a matter of consultation between you and your colleagues?

A.—Very fully.

Q.—Whatever people may have alleged came as a surprise to the general public, it would obviously be no surprise to the members of your Government, who would know exactly what you were going to do?

A.—Yes; not only the members of my Government, but one of the most brilliant and devoted Civil Servants, who is, alas, now dead, Mr. P. J. Mead, who was Revenue Secretary, and Mr. Monie, who was also a brilliant servant. They were, of course, fully consulted, and also assisted in devising this. I am afraid that I cannot claim complete credit for these things. It was largely done by my colleagues.

Q.—Your Excellency will remember that in the letter of December the 4th you were fully prepared to accept Sir George Buchanan's view on the type of wall required for the reclamation. That is on pages 10 and 11?

A.—I remember seeing it.

Q.—Was that approval as regards the type of wall given in the belief that that wall would retain whatever they pumped into it?

A.—I think so, certainly. I think I may answer that without hesitation.

Q.—Now we come to the other matter, the question of how it was decided to begin the sea wall from both ends. May I introduce it by referring you to page 2 of the Report of Sir George Buchanan, dated the 11th of February, 1922?: " Under the orders of Government, the construction of the new wall is being proceeded with from both ends simultaneously, instead of from one end, as originally schemed, involving an increased expenditure in machinery and plant "?

A.—Yes.

Q.—That is how Sir George Buchanan reports on the matter in 1922?

A.—Yes.

Q.—That it was a departure from the original scheme and one which would involve an increased expenditure in machinery and plant. Would you tell us from whom came the suggestion that the wall should be built at both ends and the reasons for it?

A.—I cannot remember from whom the original suggestion came, but it was a subject of discussion as to how best to proceed with the work between myself and my colleagues and advisers generally. Therefore, I cannot remember exactly who was the inspirer of the idea. It was a thing that would naturally arise for consideration.

Sir Frederick Hopkinson.—Why would it arise for consideration, because the whole thing was settled in the original scheme?

A.—I will explain it if I may. It would arise naturally in my view because any method that could possibly speed up the work would be constantly in our minds in view of the large sums outstanding. It seemed to me a very proper thing to consider from time to time how the work was going on and if there were possible improvements that could be made, but apart from that general consideration, the relief of congestion in the fort required that the area near Church Gate Street Station, which you no doubt know on the map, should be reclaimed and be ready for development as soon as practicable. The land in this locality would be the most valuable and the most readily saleable. It was, therefore, a sound business proposition to get it ready before other areas, in order to obtain receipts, thus recouping capital expenditure and reducing interest charges. This position was modified by the Agreement with the Government of India for the disposal of the area at Colaba, the military area. With a ready purchaser it was even more desirable on purely business grounds to recover the purchase money as soon as possible. It was still true, however, that both for the relief of congestion in the fort and for quick recoupment of expenditure the area near Church Gate Street Station should be developed before the middle blocks. I was informed that from a technical engineering point of view the work should proceed from the Colaba end, although facilities for commencing work were better at the Northern end. Sir George Buchanan agreed that it was practicable to start work at both ends. I think you have evidence of that.

Chairman.—Yes.

A.—I am not aware that any additional cost was incurred. The decision was based on pure business grounds after its practicability had been reported by Sir George Buchanan. The decision was not effected, as I see was suggested by somebody, by any consideration of a spectacular propaganda.

Q.—Sir Lawless Hepper referred to that.

A.—I am afraid that I cannot agree with him, and it certainly did not occur to me. It was pure hard business. Rightly or wrongly, it was considered to be an improvement to do it in that way for the reasons which I have stated. Something has been said in the evidence about additional plant being required in consequence of this decision. I think this must be on the later development. The " Kalu " was originally purchased for the Colaba reclamation. There was a subsequent arrangement by which this dredger, and indeed all plant required for both reclamations, was debited to the Back Bay reclamation. Have you got that clearly? It was to be credited to the proportionate cost of work done for the Colaba reclamation. That is the best reply that I can give to you on that point.

Q.—When you say that your advisers put this matter forward, you had no advisers around you with technical knowledge, had you?

A.—Technical advice of the land department?

Q.—Technical knowledge of an enterprise such as the Back Bay Reclamation?

A.—On the technical side for its possibility and feasibility I relied, of course, upon our technical adviser, Sir George Buchanan. As regards the advice of experts further than that I presume we would refer to people who were qualified to judge as to whether it was a good business proposition to do it in that way or not from the point of view of recoupment.

Q.—A good business proposition, including, of course, the ability to consider the possibility of increased cost; to look at the matter all round?

A.—Yes. We must judge of our capacities there. We had a great many business men with whom we were in constant consultation and discussion. I cannot remember

who they were at this juncture, but we were not living an isolated life, neither my Government nor my advisers. They were meeting people constantly and discussing these projects, and I adhere to the view to-day very strongly. I think that is a good course to pursue from a business point of view to reclaim that area for recoupment purposes.

Q.—Can you tell us at all what person suggested it?

A.—I am afraid I could not.

Q.—The first intimation we have got of it is in a telegram dated 4th July, 1920, which is a telegram from yourself: "His Excellency would be glad of your telegraphic opinion as to the feasibility of beginning work at both ends at the same time. Military authorities concerned in getting reclaimed land adjacent to Colaba are anxious that Colaba end should be reclaimed as early as possible." That was always the intention, was it not, that the Colaba end should be pumped into first of all?

A.—I think so, as far as I recollect. I think that was following upon Sir George Buchanan's original advice.

Q.—That the Colaba end, Block 8, should be pumped into first of all, and the military were going to acquire some 239 acres of Block 8. The original intention was to build this sea wall along, keeping the sea wall sufficiently in advance for the pumping operations?

A.—I think that was certainly roughly the case. I cannot tie myself down to numbers of blocks, because they have altered them all since I was there.

Q.—What is now marked on that map as Block 8 is at the Colaba end?

A.—That is right.

Q.—The agreement with the military would give you over 240 lakhs?

A.—240 lakhs, or rather over, that was the arrangement that I made myself.

Q.—It would give you that money immediately. It was obviously good business to fill that in as speedily as you could?

A.—Quite so.

Q.—And at the same time it was not good business to have a long length of wall lying idle?

A.—I could not express an opinion from a technical point of view.

Q.—Think, to put a lot of money into a long length of wall which was in fact lying idle?

A.—Quite so. It is a matter of opinion purely.

Q.—What opinion have you about that?

A.—I do not wish to offer opinions on technical matters, because they go very far. From a commonsense point of view I should be inclined to agree, but I do not want to be led into giving views on subjects on which I am not qualified to express an opinion.

Q.—There is no danger of that?

A.—I am very flattered to hear you say so.

Q.—Then the telegram runs: "On the other hand, His Excellency believes you considered necessary to start Western end first on account of railway communications." I think we have been a little puzzled by that, because we can find no reference to that in any report or correspondence. Can you tell us at all upon what that belief was based?

A.—No. My recollection is too vague to give you any considered opinion, but I have some vague recollection that it was to do with railway traffic and making room for it at that end. I have a vague recollection of that, and I think I am right in my vague recollection, but I am not sure. I can possibly hunt that up.

Q.—Then we get a reply to your telegram, which is sent from the Secretary of State to yourself on the 12th July, 1920, in which Sir George Buchanan reports that it is practicable to begin to work the Back Bay scheme at both ends simultaneously. Then I pass over a part of it. Then it says: "To begin building the wall in two places will not materially advance matters, unless the reclamation can also be proceeded with, and Buchanan is considering whether the new dredger "—that is the "Sir George Lloyd "—" and the 'Jinga' can work simultaneously at Eastern and Western areas." I think the "Jinga" there must be a misprint for the "Kalu."

A.—Is that so?

Q.—Because the question of buying the "Jinga" had not then occurred. The question of buying the "Kalu" had occurred, so that I shall read it, "Whether the new dredger and the 'Kalu' can work simultaneously at Eastern and Western areas." That was essential, was it not? If you were going to build the wall at both ends in order to hurry on the reclamation, you would have to have at both ends dredging and pumping plant?

A.—Unless you were going to do it by a dry filling process.

Q.—Dry filling had never formed any part of Sir George Buchanan's report?

A.—Is that so?

Q.—That is so, is it not?

A.—I am asking you. I do not know.

Q.—I am quite willing to answer the question. Dry filling had never formed any part of Sir George Buchanan's Report, but he had mentioned the question of moorum in connection with what I might call a top dressing, that is about one foot of moorum to be put upon the reclaimed mud, clay, and so on?

A.—He had not mentioned the question of dry filling at all in his report?

Q.—No, not the total reclamation of any area by dry filling?

Sir Frederick Hopkinson.—The dredgers were to do the whole of the filling; it was their function.

Chairman.—Then on the 17th of July Sir George Buchanan has had time to look into the matter a little more, and he says that the reports have satisfied him that the dredger " Jinga "—again I think that means the " Kalu "—and the new dredger can work together on the Bombay Reclamation, and therefore work on constructing the wall can proceed from both ends simultaneously. " Buchanan asks for very early orders as to whether he is to proceed on these lines, as considerable changes in design and arrangement for execution of work will be necessary." That is followed by a telegram sent by the Governor of Bombay to the Secretary of State on the 29th of July, 1920, saying that work may start from both ends. You left Bombay on the 9th of December, 1923, did you not?

A.—Yes, about then; within a few days of then; that can be checked.

Q.—That is a fact. Do you happen to know whether any calculation was ever made by any of your advisers as to whether it was physically possible to pump into No. 1 and No. 2 Block from across the land at Church Gate Street?

A.—That is the westernmost block but one, is it not?

Q.—It is the westernmost block of all.

A.—Will you kindly repeat your question?

Q.—Did your advisers ever make any calculation as to whether it was physically possible to pump from the harbour into Block No. 1?

A.—I cannot say at this date. I know they were considering filling from Back Bay at that time, because they had been making experiments in Back Bay.

Sir Frederick Hopkinson.—No, that is years afterwards that any reference is made to it.

A.—I was making a statement of fact that the thing was being considered before I left. There was a boat taking soundings in front of my windows for months before I left. I used to look at it every day. That is why I speak with some confidence on the matter.

Q.—I think we are wrong in the dates. We are speaking of July, 1920, not 1923.

A.—I understood you to say that the thing was not considered before I left.

Q.—In July, 1920, no suggestion had ever been made as to pumping from Back Bay?

A.—That may be. I thought you were saying 1923.

Chairman.—I was going to give you the letter. We have the results of the Back Bay borings.

Sir M. Visvesvaraya.—We have full particulars, and complete correspondence.

Chairman.—At the time when Sir George Buchanan sent the telegrams that I have just read, the practicability of the scheme as pronounced by him was pumping from the harbour across the island into Block 1?

A.—That is a technical matter upon which I would not like to answer.

Q.—That is a fact from this document: " Buchanan reports it is practicable to begin work on the Back Bay Scheme both ends simultaneously."

A.—That is a matter, I imagine, on which you would have no difficulty in getting a clear statement from Sir George Buchanan. He is giving evidence, I understand. That would clear up that point.

Q.—But the fact still remains, did any of your advisers, when these telegrams came to hand, suggest to you that Sir George Buchanan must be arithmetically wrong on that, because he could not get across, he could not pump the distance?

A.—No, I do not remember that that was suggested at all. It would have remained in my memory if any of my advisers had pointed out that Sir George Buchanan was definitely technically wrong on any point, and I do not recollect it.

Q.—In considering Mr. Kidd's report, you, of course, would have noticed that he estimated in 1912 that he could do the work for 325 lakhs. The figure is suggested in Sir George Buchanan's report?

A.—Yes.

Q.—That is right, is it not?

A.—I understand so, yes.

Q.—Sir George Buchanan, as we know, put the figure at 367 lakhs as work capable of being done in 1919. On the assumption that Mr. Kidd's figures were right, did it ever occur to your advisers to point out to you that the price had gone up in 1919 as compared with 1912 at least twice?

A.—What price had gone up?

Q.—The price of everything.

A.—No, because I do not think it was the fact, and they did not point it out to me

Q.—They did not point it out to you?

A.—No, because I do not think it was the fact, as I would like to point out, if I may. You refer, I understand, to this point on the general ground that the rise in prices between 1912 and 1919 should have warned my Government that Sir George Buchanan's estimate was too low; is that the point?

Q.—That is exactly the point. Let me put my question quite clearly. If one believes that Mr. Kidd had made a reasonably close estimate of 325 lakhs——

A.—Close in which sense? Do you mean from the Scotch point of view, or from the other point of view?

Q.—If one believes that Mr. Kidd had made a reasonably accurate estimate of 325 lakhs, and had noticed that he had said he was loading the labour with 20 per cent. for possible rises, and that he was loading the price of materials with 20 per cent. for possible rises, and if anybody had thought the matter over, and came to the conclusion that Mr. Kidd's estimate was probably an accurate one, ought it not to have occurred to your advisers, and, indeed, to you, when you were reading it, that if Mr. Kidd could do it for 325 lakhs, Sir George Buchanan could not possibly do it for under 700 lakhs?

A.—My reply to that is: No, I do not think so. I think I have apprehended your point rightly. I am not aware how far the items of Sir George Buchanan's estimate have been actually checked with reference to the rates for labour and materials prevalent in Bombay in 1919. I can only make the general criticism, which is a layman's observation, and say that in the first instance the estimate of Sir George Buchanan was not accepted at 367 lakhs. You are probably aware of that, are you not? That is not accurate.

Sir Frederick Hopkinson.—You put on 10 per cent.

Chairman.—You added another 33 lakhs and you made it 400?

A.—We made it 400. We agreed to add 10 per cent. We did that in view of the increased rates for labour and material. We agreed to add 10 per cent. to this estimate and to take the total cost of the project at Rs.400 lakhs. The increase made seemed sufficient at the time. We have to consider these matters from the point of view at the time at which they were done. So far as the Bombay Government are now concerned, the comparison of Mr. Kidd's estimate should be with a Government estimate of Rs.400 lakhs. I hope that I have made clear the difference between 325 and 400. In the second place, consideration must be had to the original proposal, when Mr. Kidd made his estimate, that his firm, Messrs. Lowther & Kidd, should carry out the work at an inclusive charge of 5 per cent. on the outlay, subject to a maximum of 5 per cent. on the estimate as finally accepted by Government after careful scrutiny, but with a bonus of one-fifth of any saving that might be achieved. It is rather an important point. Up to 1914 at least it was the intention of the Government of Bombay, I understand, to undertake whatever reclamation was decided upon through his firm and on these terms. It was only reasonable to regard Mr. Kidd's estimate as having been framed on lines which would protect his own firm's interest and to consider it, in the light of Sir George Buchanan's figures, as a very liberal estimate. If you would like me to read again the reasons why I say that, I will read them again. The great fact is that he got one-fifth of any saving.

Q.—We know that, of course, from Mr. Kidd's offer.

A.—The deduction there that I make is, of course, a perfectly sound one. The Bombay Government were entitled, in view of those particular conditions, to think that he protected himself very well, and therefore his price was not too low but pretty careful.

Q.—That is right.

A.—Mr. Kidd's ideas of economy in the interests of Government may be gauged from the fact that in January, 1919, he tendered on behalf of Sir William Armstrong, Whitworth & Company, at greatly enhanced rates, including Rs.4 per cubic yard for mud filling and Rs.3.8 per cubic yard for murum filling. I think the latter figure is more than twice the actual experience costs. The Committee can judge of these estimates for themselves, but I think they add point to my suggestion that we were entitled to think that Mr. Kidd was looking after himself and his firm very properly but very well; that it was a liberal estimate.

Q.—That he was not likely to be a loser on 325 lakhs?

Q.—Certainly not. It was a large estimate rather than a low one.

Sir Frederick Hopkinson.—When did you learn these prices that you have just told us?

A.—I suppose we knew them all the time.

Q.—I do not think that Armstrong, Whitworth & Co. as a firm of contractors were in existence at that time?

A.—In January, 1919, my information is that he tendered on their behalf.

Chairman.—In 1919, when Mr. Kidd was a member of Armstrong's, they did put in a tender?

A.—That is my information.

Sir Frederick Hopkinson.—Do you know for what work?

A.—For the reclamation.

Q.—I do not think they did. There may be a misunderstanding about it?

A.—There may be a misunderstanding. The point I wanted to bring out was that he charged this rate for murum filling, which was proved afterwards to be a very excessive rate in practice; that is all.

Chairman.—I think I can clear it up. I think the position was that Mr. Kidd was acting for a syndicate, and it must have been at that time, in or about 1919, at all events, that he did submit a tender for the reclamation. That is what I understand.

A.—I think so.

Q.—Very well, we will clear that point up.

A.—I can clear that up afterwards. That is my information. The point I wanted you to take is whether we were justified in thinking Mr. Kidd's estimate a pretty liberal one. I have given you those two points to show you why.

Sir Frederick Hopkinson.—It all depends whether you got these figures before or afterwards.

Mr. Billimoria.—The subject that His Excellency has mentioned is stated in Sir George Buchanan's Report on page 9, paragraph 27.

Chairman.—" In January, 1919, Mr. Kidd, who had meanwhile left the firm of Lowther & Kidd and become attached to Sir William Armstrong, Whitworth & Co., made an offer on behalf of that firm to reclaim a gross area of 350 acres, but at greatly enhanced rates, the prices for mud filling being increased to Rs. 4 per cubic yard and murum backing to Rs. 3.8 per cubic yard." It was limited to 350 acres?

A.—I think that is what I said.

Sir Frederick Hopkinson.—I think there must be a misprint, because nobody would ever accept Rs. 3.8 per cubic yard for murum filling?

A.—I cannot accept that.

Q.—It is not costing the Government of Bombay half that at the present time?

A.—That is exactly what I say. Those are the figures we have before us which I think justifies me in saying that Mr. Kidd was protecting the interests of his firm, very properly and very liberally. That is the point I am trying to make. I think, as you say, that the experience cost is nearly half that.

Q.—I should say that it ought to be one quarter?

A.—Something like that. Anyhow, if the figure is right my point is good; that is all.

Chairman.—When you made the speech to the Indian Merchants' Chamber of Commerce on the 9th August, 1921, you were no doubt of opinion that 702 lakhs represented the fair price of the work to be done?

A.—That is so.

Q.—Did you ever have any discussion about that matter with Sir George Buchanan as to how it happened that work which in September, 1919, it was said, could be done for 367 lakhs was manifestly in August, 1921, going to cost about double?

A.—I am afraid I cannot remember any particular occasion of any conversations. I am afraid I cannot recall any of them now so as to be able to give you chapter and verse for them. That would be impossible, I am afraid, after so long a time.

Q.—You must have been seeing Sir George Buchanan, I suppose, when he came out in the cold weather year after year?

A.—I was certain to have seen him once or twice on each visit.

Q.—By seeing him I mean having a discussion informally, if you please, but nevertheless a discussion about Back Bay?

A.—I should be perfectly certain that I did have such discussions, but I cannot recollect them or give you the nature of their tenour at this moment, as I have no record of them. If you can find such a record amongst the papers——

Q.—There is no such record. We must leave that. There is another matter about which I want to ask you. Do you remember anything about a Bucyrus steam shovel?

A.—I remember the name Bucyrus steam shovel because I remember that we were using them, I think, to pull down a hill near Worli.

Q.—I will read you these telegrams and ask you a question on them. There is a telegram in April, 1920, which is addressed to you, probably by Lord Furness, I should think?

A.—Was it something to do with the Panama Canal?

Q.—It is sent from Colombo, and it is addressed to yourself, the Governor of Bombay?

A.—Yes, I remember receiving such a telegram.

Q.—I will read it to you. (*Telegram read.*)

A.—I remember that such a cable came. He had been, I think, yachting near Bombay and he went to Singapore. I think that such a telegram did come.

Q.—The next document we have is a wire from the Government of Bombay to the Secretary of State: "Please convey following to Sir George Buchanan (begins) Lord Furness cables two Bucyrus shovels for sale." Then it gives a technical description of them. "These shovels can be loaded immediately. Can you make use of either of these for work in Bombay? If so please cable me immediately." That was an enquiry sent to your technical adviser as to whether a Bucyrus shovel would be of value in the reclamation work?

A.—Yes.

Q.—The reply that you received is from the Secretary of State for India to yourself dated the 12th April, 1920: "Your telegram dated the 9th April, Bucyrus shovels. Buchanan considers smaller shovels very useful for Back Bay scheme and price reasonable. He recommends purchase subject to inspection in this country." That transaction went through, and one Bucyrus shovel was purchased. Did you ever learn that in point of fact it cost over £10,000 and never did a day's work?

A.—No, I am afraid I never heard that. It would be a matter that I would not see. A telegram like that would come to me, you must remember, merely because Lord Furness had met me. It would go on to the Department and be dealt with there.

Q.—That is right?

A.—I never heard that the shovel had been a failure. I understand that we had used them on the Worli reclamation. I went round meantimes to see them. I remember the name of that particular thing because I heard that they were used in Panama. It was a question whether we would get them from Panama where they had done the work, but I never heard that the shovel had been a failure.

Q.—Did you ever go to the quarry at Kandivli?

A.—No, I never went.

Q.—You would have seen the Bucyrus shovels and three others lying there?

A.—You mean our stone quarry?

Q.—The Back Bay reclamation quarry?

A.—No, I was always going and never went.

Q.—The evidence is that the Bucyrus shovel had a wrong gauge for the railway, and in addition to that it never did a day's work for two reasons, one, that there was no sufficient face for the shovel to operate on, and secondly, that there was nobody who was competent to make it work?

A.—That is a thing that I cannot remember the details of.

Q.—All I want to get from you is that you put it up to Sir George Buchanan plainly in terms, "Can you make use of either of these in Bombay," and his answer is "Yes"?

A.—You say so, and I have no doubt that it is true. I have not got the papers. It was our duty, if there was a question of materials in regard to which offers came along, to put the matter up to our technical adviser in case it was any good to purchase them. All materials were not easy to get at that time.

Q.—At that time there was a great shortage of materials?

A.—I do not remember Lord Furness speaking to me about it at the time, but Lord Furness probably saw an opportunity of doing business. He saw the works as he came through; he would know about them.

Q.—He would know what was going on in Bombay, and he sends you a telegram. Then you asked your technical adviser the perfectly plain question, "Can you make use of either of these for work in Bombay." Sir George Buchanan says "Yes," and thereupon the matter goes through?

A.—That is so

Mr. Billimoria.—If it is suggested that the Bombay Government purchased these without enquiry that is not correct?

A.—Obviously. The telegram confutes that. There was nothing purchased in that way at all. Everything went through normal and departmental channels as far as I am aware.

Chairman.—Is there any other matter that you would like to mention to me before I conclude your examination? Is there anything that has been omitted?

A.—No. I would like at the very end to make a few remarks on the general aspects of the Scheme, if I may. I would like to leave that until every member of the Committee has had their fill of such knowledge as I have.

Q.—Did you leave Bombay on the 9th December, 1923, in the full belief that notwithstanding the increased expenditure the reclamation would proceed satisfactorily?

A.—I would like to put it more strongly than that. To the best of my knowledge and belief the reclamation was proceeding without a hitch during my three years' period of administration. I was aware of no serious difficulties of any kind. The work was going on according to the larger estimate, of course, and there was a general feeling of optimism, and I knew of no difficulty. You must remember that of course I had nothing whatever to do with the operations of the dredging. I think they actually started the dredger formally working the morning that I left.

Q.—I hope I made it clear that the day before you left, the 8th December, 1923, the dredger began her work?

A.—I think it was only formally on that day. I remember that I turned the dredger on. I went down to a little function of starting the dredger early in the morning the day before I left.

Q.—The evidence is that she began work on the 8th December, 1923, the day before your Excellency left?

A.—That is right.

Q.—And therefore you can give us no help whatever as regards the details of her work?

A.—No.

Q.—But at the moment when you left Bombay the building of the sea wall and the other works were, as far as you knew, going perfectly well?

A.—I left with complete optimism knowing that there was nothing wrong of any kind, shape or description.

Sir Frederick Hopkinson.—Except, may I point out, that Sir George Buchanan said that the work was going to be finished in 1926 and the dredging was going to take a minimum of five years and the dredger was only started on the 8th December, 1923?

A.—Yes. I think there was two years extra time or 18 months.

Q.—Therefore, you knew that it could not possibly be done in accordance with that original programme?

A.—I may have known that there was some extension of time, but Sir Frederick Hopkinson would know himself, as an engineer of very great experience, that neither as regards estimates nor as regards time do even the greatest engineering firms keep always within the limit. There is some give in all these things.

Q.—My experience is that in my particular branch of business if they do not keep within their estimates they get in a certain very unpleasant place?

A.—In the Bankruptcy Court. You have got to take a reasonable view of a situation like that. We were passing through very difficult times, but I adhere to my view that even if it were the case that there had been some slight increase of time, I was very confident as I am now as a matter of fact.

Q.—You remember, of course, that the dredger had been lying idle in Bombay for 20 or 21 months?

A.—Yes. I do not remember that it was as long as that. I knew it had been lying idle for some time.

Q.—That did not point to any very great success, did it?

A.—I have not prepared any notes about this; I am speaking at random. I did not know you were going to ask me a question about that, but there was a benefit, to the best of my recollection, in buying the dredger before a certain date, as we were warned. The India Office of course is finally responsible for it. It is nothing to do with my Government. We were warned that the prices would go up after a certain date. That was the reason why the order for the dredger was placed rather prematurely possibly.

Chairman.—It was anticipated that prices would go up?

A.—Yes.

Q.—But actually and in fact, if one had been able to look ahead, the prices dropped tremendously in 1921?

A.—Yes, but I think I am right in saying that we were warned by the India Office that the dredger makers said that they would not be able to quote us such low terms unless such an order were placed by a certain date.

Q.—That is the letter of the 12th September, 1919, which is attached to the report?

A.—I think I am right in my recollection.

Sir Frederick Hopkinson.—The only remark I should make about that is that I am wondering if you had not been bluffed?

A.—Possibly. I do not know about that. That is a matter of opinion and I will leave the Committee to decide that.

Q.—We have sufficient information?

A.—We had to consider the matter in the light of our existing knowledge. A lot of people are both foolish and wise after the event, but certainly we can be wise after the event.

Q.—We have quite sufficient evidence about that.

A.—You have plenty of evidence on which to come to your own conclusion about it.

Sir M. Visvesvaraya.—I will put some direct questions to your Excellency.

A.—Do you mean apart from this list?

Q.—They are included in that list in a general way. In the speech that you delivered in Bombay you stated that this was the simplest of all the reclamations undertaken in Bombay.

A.—To whom was the speech made?

Q.—To the Indian Merchants' Chamber.

A.—I know the speech.

Q.—And that they, the Government, had consulted the best experts they could get hold of. May I ask you who were the other experts who were consulted?

A.—Sir George Buchanan. I have already been through all this as regards the experts.

Q.—Who were the other experts?

A.—Sir George Buchanan, such local experts as we had in the Public Works Department, and we had Mr. Kidd's report before us and all the previous reports over the last 10, 12 or more years. Those are what I generally refer to in that speech.

Q.—They were the best experts you could get hold of you have said?

A.—That is what I said and that is what I mean.

Q.—Sir George Buchanan was your only expert?

A.—No. I must repeat exactly what I said. He was not our only expert. We consulted such public works experts as were here available and we had all the experts' views before us of a good many years past.

Q.—Are any of the views of the Public Works Officers on record?

A.—I cannot tell you that I am afraid.

Q.—You did not consult the Port Trust authorities. They are concerned in reclamation schemes?

A.—Those enquiries are generally made not by Governors but by Government officials and I cannot tell you what they did.

Q.—We have looked up the records. The Port Trust was not consulted at the time.

A.—If you say so and you are satisfied of that, I can only give you the answer that I have given you, that that would not normally be done by myself in any case.

Q.—No, but before launching a big scheme of this sort, do you not consult the experts near you?

A.—I have tried to make the point before that the time in our opinion after some 18 years of study had come for decision. It was also a view shared by the then Secretary of State. It was also a view shared by the Municipal Corporation of Bombay who pressed the urgency of the scheme as a general remedy of the situation.

Q.—That was all good, but this was a much debated scheme?

A.—Yes, very much.

Q.—And several people had turned it down. An American firm in a report in 1919 which could not have escaped your notice, said that a scheme like this was going to be a failure.

A.—I think you will find that that American firm disclaimed all ability to discuss the Government's estimates in any way. That rather discounts the value of their remark. I think you will find that that particular American firm disclaimed any ability to discuss the Government estimates in any way at all or express a view upon them.

Q.—That does not discount the value of their opinion on the merits of the case?

A.—I think it does to that extent. Are you making a statement or asking a question?

Q.—I want information. I must explain to you that these questions are put in order to elicit information and not to criticise?

A.—My information is that a firm of New York engineers supplied that opinion, not to the Government but to the firm of Messrs. Tata but whether it was Mr. R. D. Tata or Sir Rattan Tata I do not know.

Mr. Billimoria.—Sir Rattan Tata.

A.—They were an engineering firm who, I think, said it was a mad scheme or something like that—and in spite of their opinion the firm of Tatas were foremost later on in seeking to carry out the reclamation of Back Bay themselves by private enterprise. As regards their criticism, I repeat that you will find they disclaim all ability to discuss the Government estimates in any way, and to that extent I think their views are discounted.

Sir M. Visvesvaraya.—The Government of India also had turned down all previous schemes of reclamation till 1917?

A.—Is that so?

Q.—Yes, and it was only your Excellency's influence that got this scheme sanctioned.

A.—No. I should not flatter myself to that extent. I should think it was very largely the late Secretary of State's very keen desire to look after the masses of the people than to care for the vested interest.

Q.—That is true?

A.—It was his desire that brought it through; that is what I think. The Government were looking all through for the great mass of the people who were living in squalor beyond words. It had been held up. We were fighting for the people here as against vested interests. There is no doubt whatever—I say this with no critical sense—that landlords are apt to look after their own interests. It is very natural the Government stepped in after very long scrutiny of many years, faced with many years experience, with the firm decision by the Secretary of State who had taken a great interest in this great social problem, and if you will examine the period when I was in India, you will find that one thing stands out very clearly. You can see from all the public addresses presented to me and other such evidences that you can get, that such criticism as there was came from a small section, the Indian Merchants' Chamber, a bureau which chiefly represented a certain class, whereas the great overwhelming mass of support, both in money and morally, came from the people whom people had not worried about before, who presented me with an address. I think it was the first time that they had ever presented one to a Governor in Western India. It came from the classes who recognised and realised that the Government had at last tried to do something to ameliorate their condition, so that I do not flatter myself that it was anything to do with me. It was the inspiration and interest which the late Mr. Edwin Montagu had which largely, I think, achieved the result. I was merely a humble executant, a keen initiator and executant.

Mr. Billimoria.—You have referred to vested interests. How did the Indian Merchants' Chamber come in as vested interests?

A.—I said landlords. I have used the word. I think the Indian Merchants' Chamber had members in that Chamber who had personal interests, and very strong ones. If you have not had evidence of that I think you should get evidence of it. It is very easily available. There have been people who possibly have even given evidence before this Committee who have had speculations in land, and who are not interested to see these schemes succeed. There are others who have lost money, and who, from behind the scene, prompted an agitation. I am speaking what everybody knows.

Chairman.—That must occur in every case of a scheme of this kind.

A.—Yes. I am making no reflections on anybody. I am stating the facts in order that the Committee, if I may venture to say so, may be able to have a broad view of the whole thing. We were up against certain difficulties. I do not complain of them. We had to meet them. Those difficulties have remained right through in this scheme. They must not be ignored; they are there. I do desire to emphasise that perhaps for the first time the local Government desired to do what they could to relieve what they knew to be a serious condition, and, perhaps for the first time, they had an enthusiastic backing, and, indeed, initiation almost in its last phase by the Secretary of State for India himself.

Sir M. Visvesvaraya.—The complaint is that the works were started with undue haste; that is the point that I am putting to you.

A.—Anybody who commits a crime against inaction in the East commits a grave crime, but they have to commit it sometimes. I do not know if you think 18 years is undue haste. I have committed that crime, I am afraid, by trying to get something done; I am not ashamed of it; I am very proud of it. I do not consider it undue haste.

Q.—In doing that, certain responsible commitments were made which have resulted in difficulties and loss; that is the next point?

A.—I cannot accept that. I hope that it is not true, and I do not accept it.

Q.—The scheme which was to cost 367 lakhs first went up to 702 lakhs, and it is now in the neighbourhood of 1,000 lakhs. To complete it it would cost about 1,000 lakhs, according to the latest estimate of the Engineers?

A.—I am not willing to accept a figure until the Inquiry is over.

Sir Frederick Hopkinson.—That is the broad outstanding criticism of Sir George Buchanan's estimate in 1919. Without going into details, the estimate of completion is now 1,000 lakhs?

A.—When your have given your final verdict I shall attach importance to it, but I must not accept any figures until this Inquiry is over, must I?

Q.—I think you can take that figure.

A.—I am not quarrelling with it.

Q.—It will not be far out.

A.—I do not know anything about it.

Sir M. Visvesvaraya.—The Royal Indian Marine was also not consulted, I think, and that has led to the other difficulties. Certain portions of the Harbour have had to be excluded from the dredging programme?

A.—I must give you the same answer to that. I think that one of my colleagues certainly did consult the Royal Indian Marine. I cannot be certain, but I have every reason to believe that he did.

Q.—We have made enquiries there, and there is nothing on record?

A.—It may be so. Everything is not on record in any Government where you are very driven. You must remember that we were dealing with a very acute situation in every respect. One had many things to do besides these. It was, I think, agreed by all concerned to be the most critical moment from the point of view of executive Government of any time since the Mutiny, certainly in Western India, where we had a very serious and grave situation to handle from the Military point of view. Therefore if everything is not on record it does not prove that it did not happen. I think probably that one of my colleagues was certainly concerned in it. Anyhow, it would not be the normal course of my duty to do it. It would be done by one of my colleagues.

Chairman.—Who had you in your mind?

A.—I had in my mind Sir George Curtis, who took a particular interest in everything to do with the Royal Indian Marine. I have a very strong memory that he did, but I cannot guarantee it. I was very surprised when I saw it in the evidence that the Royal Indian Marine said they had not been consulted. I remember saying that that was absurd.

Sir M. Visvesvaraya.—The Chief Officer gave evidence before us?

A.—Yes, I saw that. I was very much surprised.

Q.—Sir George Buchanan was sent by Your Excellency to the Government of India to explain matters to get sanction?

A.—As far as I remember; by my Government, certainly.

Q.—A large number of letters and telegrams were sent by your Government to the Secretary of State, and the Government of India, to expedite matters?

A.—We took every possible step we could to expedite matters in order to avoid delay.

Q.—The Secretary of State said he was embarrassed by them?

A.—I had not heard that he was, but I have not the slightest doubt that he might easily have been.

Q.—The correspondence says that.

A.—People always are embarrassed when they are being asked to expedite matters. I am often embarrassed myself.

Q.—It is said that the estimate was imperfect, and not based on correct data, and that the estimate was prepared in a great hurry?

A.—That is your statement.

Q.—That is a public statement.

A.—That has been said by the public?

Q.—I want to know what the truth is?

A.—No, that is not my view. Every possible care was taken, as far as I can tell.

Q.—Even before the estimate was sanctioned, the order for the dredger was placed with a firm here?

A.—With Messrs. Simons & Co.

Q.—Yes. The acceptance of the principle of the dredger ruled out the preparation of any alternative estimate for reclamation?

A.—I should say that was true, yes. That is, as far as I understand, your statement. If you could ask me the question it would be easier for me, perhaps, to answer it.

Q.—What I say is that because a dredging proposition was accepted even before the the estimate was sanctioned, alternative estimates could not be prepared, or were not prepared afterwards, and any alternative method of reclamation was ruled out?

A.—If you mean to ask me whether I do not think that once so expensive a dredger was ordered it committed one to reclamation by suction dredging, my answer to you would be yes.

Q.—That is the point. An estimate of 367 lakhs was quite a good estimate, and quite satisfactory?

A.—That, I accepted from my expert. It was 400.

Chairman.—The estimate of the expert was 367 lakhs. The Government put on the rest.

A.—I thought Sir M. Visvesvaraya was asking on the figure that we accepted.

Q.—Yes, but that was not the expert's estimate?

A.—No, it was what we accepted.

Sir M. Visvesvaraya.—From 400 lakhs it went up to 702 lakhs. Because there were no alternative estimates, the fact that there was a cheaper method of reclamation than by dredging was ignored. By moorum filling the work could have been done much cheaper than 702 lakhs?

A.—I am very sorry, but I do not know what you are asking me. You are making a statement that it is much cheaper to fill it up by dry filling than by dredging. What do you want me to reply to that?

Q.—An expenditure of 702 lakhs had to be accepted because the scheme was unduly rushed?

A.—I do not accept that it was rushed.

Q. -Alternative estimates were not prepared?

A.—I cannot accept the statement, if it is made, that the scheme was unduly rushed after 18 years of preparation, or that any damage resulted from undue haste.

Q.—I do not know whether Your Excellency has heard that in 1865 they had prepared an estimate for reclamation by moorum filling?

A.—I have heard a lot about the history, but I do not remember that.

Q.—If so, an alternative estimate for moorum filling should have been prepared at the time of the sanction. All alternative proposals should be considered before a scheme is finally accepted. What is cheaper is usually accepted, is it not?

A.—I have a rough idea of what you want to ask, but I cannot get the point.

Q.—At 367 lakhs, or 400 lakhs, the estimate was satisfactory. It would not have competed with dry filling?

A.—My view at the time, taking the advice of my experts, was that it was a proper estimate. That is all can say. I cannot go further than that.

Chairman.—And that the reclamation was a dredging proposition, as opposed to a dry filling proposition?

A.—Yes, certainly, except for the dressing. I think we always had under consideration a moorum dressing on the top.

Sir M. Visvesvaraya.—The dry filling was not considered at all. No estimate was prepared for dry filling?

A.—I do not think an estimate was prepared for dry filling. It was considered, because I remember a considerable conversation at that time.

Q.—There is nothing on record about it?

A.—I am trying to give you the maximum information I can, whether it is on record or not. I do remember a conversation in which dry filling was discussed, and I remember certain railway difficulties being rather difficult to overcome as regards the large number of trains every night which had to come in on that narrow area, and so on.

Q.—There again, we are still in the same position, that there ought to be some record, and there is none.

A.—I cannot say about that without notice, I am afraid.

Chairman.—It was obviously in Sir George Buchanan's mind. The letter of the 30th of May invited Sir George Buchanan to pronounce on the suitability of the proposed method of reclamation by means of dredging, or alternative proposals for same.

A.—Therefore, presumably, he considered it all.

Q.—It was left to Sir George Buchanan to have turned down the matter as a dredging proposition altogether?

A.—Or *vice versa.*

Q.—He could have said : " This is a matter which can only be done by moorum filling, or can be done more reasonably." That he did so consider it is evident from page 9, paragraph 29, of his report : " There is an abundance of material in the harbour

for the filling, and it can be deposited in the area to be reclaimed by means of modern suction dredgers much cheaper than in any other way."

A.—That disposes of that point.

Sir M. Visvesvaraya.—It does not. When it came to 702 lakhs the dry filling proposition was much cheaper?

A.—You make that statement?

Q.—Yes, and I make it very deliberately, and it has been made by others also. Sir Alexander Gibb is an authority, and he has also made a statement. Mr. Neilson, the present Chairman of the Port Trust, has stated that this is not a dredging proposition. He is on the spot and he knows the conditions.

A.—Do I understand you to suggest that it was much cheaper to use dry filling than it was to do it by suction dredging at a cost of 400 lakhs, if that be proved to be a success? I ask as a matter of interest.

Q.—Yes.

A.—It would still, even then, have cost less than 400 lakhs?

Q.—That it was a good scheme?

A.—Of course, that was all the information available at the time of our decision.

Q.—The complaint is that fuller information was not collected at the time.

A.—If we had been able to be wise after the event, if we had known that it was going to cost a great deal more than 400 lakhs, possibly the dry filling might then have become cheaper, but with the information at our disposal, or at our experts' disposal, at that time, 400 lakhs was the figure, and I understand that you do not suggest that it would have been cheaper to fill with dry filling at 400 lakhs.

Q.—No.

A.—We were born three years too early. We did not know what we knew two or three years later. Whether we could have known is a matter for the Committee to decide. We did not know. We had to accept the estimate given, and I have given my reason for saying that we had a fair reason for thinking that it was a fair thing.

Q.—The estimate was wrong?

A.—It is not the only one. I think many schemes outside India have been wrong to an even greater extent.

Sir Frederick Hopkinson.—All the more reason for care here.

A.—All the more reason for care here. I am more interested than anybody that it should be successful.

Sir M. Visvesvaraya.—When you sent up the 400 lakhs scheme did your Excellency regard it as a rough scheme, or did you consider it was a final scheme?

A.—I am not one of the world's great optimists. I took it as reasonably final as a figure as that kind of estimate ever is. I hoped there would be no increases, but I could not be sure that there would not. I took it like an ordinary business person would, and hoped that it would be as final as possible.

Q.—I asked whether, when the 702 lakhs scheme was sent up, it was stated that the 400 lakhs scheme was a provisional one, and not final?

A.—It is a question of terminology. You ask me my views, but, as far as I can tell you, that was my impression of it.

Q.—The revised estimate for 702 lakhs was sanctioned by Your Excellency's Government, without reference to the Secretary of State, or the Government of India?

A.—Yes, to the best of my recollection.

Q.—It was not placed before the Legislative Council before it was sanctioned?

A.—We did not have to do that. I understand that the point has been challenged as to whether our attitude was constitutional at that time, and whether, when we found there was an increased price, we should not have referred the matter again to the sanction of the Government of India. Our attitude was perfectly constitutional. The ultimate authority had changed then, and under the Reform Scheme the Legislative Council inherited a good deal of the authority which was vested originally in the Government of India. We took every precaution to see that our attitude was constitutional, and it was constitutional. My view is that it was completely constitutional, and, to the best of my recollection, having got a new authority over us we went to that authority with every reasonable speed for their sanction. I think that that is borne out by facts.

Q.—The 702 lakhs scheme was not actually sanctioned by the Legislative Council, although it was accepted by them later on?

A.—It had to come in the Budget every year. They knew exactly what it was. It was merely a question of method. They had an opportunity of saying No to it, and they were fully aware all about it. You must further remember that I had, whether wisely or not, drawn the matter to the attention of the Indian Merchants' Chamber, and

Bureau. I made them a present of the fact that it was going to cost 702 lakhs, a good deal before that, if my recollection serves me.

Chairman.—In August, 1921.

A.—I do not quite see how that tallies with the criticism that we did not give the public our full confidence when I informed them so very long ahead.

Sir M. Visvesvaraya.—Was it not necessary for the scheme to be discussed by the Legislative Council before it was sanctioned?

A.—Nothing was necessary, except what was done.

Q.—What the public, the critics, say is that the scheme, in the ordinary course, would have gone up to the Secretary of State, and if his control was withdrawn it should have gone to the Legislative Council. It should not have been sanctioned by the Government themselves?

A.—I am afraid that even critics are not always right, and I do not agree with them. I think that the attitude was perfectly constitutional and proper, or else I should not have been a party to it. I was very careful about that, especially at that time.

Q.—Was any statement of financial results considered along with the estimate? Was any profit and loss statement, or profit and loss account, made out when the scheme was sanctioned.

A.—When the scheme was sanctioned by the Government of India?

Q.—Yes.

A.—I cannot at this juncture recollect exactly in what form the figures went up, but I think the fullest possible figures were sent. In proof of that, you may be perfectly certain that the Government of India, and the Secretary of State, would not have sanctioned a scheme of this magnitude unless they had before them sufficient data on which they thought it right to go. I think that is probably before you.

Chairman.—We have got it.

A.—I do not know the actual details.

Sir M. Visvesvaraya.—Was the tender for the dredgers examined by any technical officers of Your Excellency's Government?

A.—It was examined by Sir George Buchanan who was the expert locally, and, of course, the real full authority and responsibility for that must be taken by the Secretary of State's officers here, Sir John Biles or whoever it was there. They sanctioned and we merely indicated the kind of dredger that was required. I believe it was entirely left to the Secretary of State for India to decide what should be done in the matter.

Sir Frederick Hopkinson.—I think the Government of Bombay gave instructions for the dredger to be ordered from Messrs Simons.

A.—I think they indicated their view.

Chairman.—They indicated their view?

A.—They are not in a position to give instructions.

Q.—It almost went to the extent of instructions. The Government of Bombay did indicate the result of discussion with Sir George Buchanan. He had mentioned first of all that there were about four firms on the Clyde who were turning out good work.

A.—Messrs. Simons and Messrs. Lobnitz are the only two firms I remember.

Q.—At some time or other Messrs. Simons' name must have been mentioned and after this report there is a telegram from the Governor of Bombay which does in fact amount to a request?

A.—A request, not an instruction; an indication of their view.

Q.—It is a clear indication of their wish?

A.—It may be so.

Q.—That the dredger should be purchased from Messrs. Simons?

Sir Frederick Hopkinson.—Actually it was the only tender you had.

A.—That was not my information.

Q.—That was so in effect. You had a cable from Messrs. Lobnitz but no other.

A.—I understand that Messrs. Lobnitz tendered a higher price than Messrs. Simons; that was my information.

Q.—Messrs. Lobnitz sent a cable only .

A.—I do not mind whether the tender was in a cable or in a letter.

Q.—It was not a comparative tender?

A.—Is it not true that Messrs. Lobnitz quoted a higher price than Messrs. Simons?

Q.—But they specified a totally different thing; they specified two dredgers.

A.—I understood that the specification really had nothing to do with me.

Q.—No.

A.—I understood that specifications had been sent, at any rate, to those two, if not more, and that Messrs. Simons' and Messrs. Lobnitz were the two replies that we

got. If Messrs. Lobnitz, on having had the same specification as Messrs. Simons, sent an errant reply not conforming to that specification, I do not know why they did.

Q.—We have not been able to get yet what invitations were sent out for tenders.

A.—No doubt Sir George Buchanan may clear that up; that was my memory.

Q.—So far he has refused to inform us.

A.—That was my memory which was very vague, but in any case it was the Government of India Authority who had to decide and take responsibility in that matter. I think you have already had Sir John Biles' evidence, have you not?

Q.—The recollection in my mind is that it was a definite instruction from the Government of Bombay to purchase the dredger from Messrs. Simons?

A.—The Government of Bombay, I must tell you, is not in a position to give instructions to the Secretary of State for India

Chairman.—We need not argue about this now. There was a request and a clear indication.

A.—That is right. I have already said that there was an indication of view.

Chairman.—If it is not of importance, we might pass away from it.

Sir M. Visvesvaraya.—" In the opinion of the Government of Bombay Messrs. Meik & Buchanan should be solely responsible for the design and construction of the plant." That was the telegram sent by the Government of India to the Secretary of State. The Government of India also suggested or at least were of opinion that other experts in London should be consulted. I suppose your Excellency is not aware whether anybody was consulted.

A.—With regard to what?

Chairman.—We know that they were not from the answers to the telegrams. At once it was taken up. We know from the documents what occurred. It is no use asking Lord Lloyd that because we have got it in the documents.

A.—I think I have seen it in evidence already. I am afraid I am not in a position to say.

Chairman.—We have it quite clearly on the documents.

Sir M. Visvesvaraya.—The dredger was ordered on 4th May, 1920. It is stated that it was ordered too early, and that it was left unused for about 21 months?

A.—I have tried to give the reason already as far as my recollection goes. These, again, are technical matters. It is Sir George Buchanan's business.

Q.—The dredger " Kalu " was also purchased in 1919, and it was lying unused for five years. Why was that purchased so early?

A.—I am afraid I cannot tell you that without notice. It is again a departmental matter very largely. I will look it up for you and try to find out.

Q.—It means a lot of money invested?

A.—I am sorry that I have not got that. If you had asked me I would have tried to find the papers about it. I think you must have knowledge of that.

Chairman.—We know the facts with regard to it.

A.—It was bought, as far as I understand, for Colaba, or was the " Jinga."

Q.—The " Kalu " was originally purchased for the East Colaba reclamation?

A.—That is right.

Q.—Then eventually when that was abandoned it was said: " Very well, if we are going to build the sea wall at both ends bring the " Kalu " in and the " Kalu " will pump into No.1 or No. 8, whichever may be more convenient "?

A.—That is my recollection.

Sir M. Visvesvaraya.—One other statement is that the dredger was not purchased in the open market on competitive terms; that the order was given to one firm only on very slender information?

A.—I am afraid that I do not agree. I cannot tell you any more than I have already told you. All the facts about the purchase of the dredger I know are in your evidence. If I could possibly supply any added information I would gladly do so. The dredger was purchased, I consider, in an absolutely proper way on expert advice after tenders had been called for. If Sir Frederick Hopkinson thinks that there is a point to be made in criticism of that I am not able to discuss that.

Q.—The complaint is that it was entrusted to one expert only, and your Excellency placed too much reliance upon one expert?

A.—Will you tell me how many experts you think in each case we should have consulted. I am very anxious to know that.

Q.—As many as are considered necessary at the time.

A.—How many would you consider necessary?

Q.—Two or three. I should talk it over with two or three people.

A.—How would you talk it over with two or three?

Q.—I would have a private conversation, and then come to a decision upon it. I am asking for correct information. Your Excellency just now stated that the order was placed with Messrs. Simons, Ltd., to the exclusion of other dredger suppliers because they did not give proper tenders?

A.—I did not say so.

Q.—Regular tenders in the open way were not invited?

A.—I am afraid I cannot add anything to my reply. I have told you that I believe the orders were placed in a perfectly proper way, and the ultimate decision rested with the Secretary of State for India. At any rate, my Government was not concerned in that.

Q.—In the case of the dredger also your Government suggested to the Secretary of State that Messrs. Meik & Buchanan should be treated as the sole advisers?

A.—I believe that is the case, certainly.

Q.—Why was that so?

A.—We had to choose somebody. I have given you my reasons for my selection of Sir George Buchanan. I have told you that he had a history of long experience of Indian conditions in the monsoon. He was very high in the favour of the Government of India, and he had a considerable reputation, both for work done in Burmah, in Basra, and elsewhere. He received a knighthood as a mark of the Government of India's appreciation, and he obviously seemed to be a suitable person because he had knowledge of dredging conditions.

Q.—But you do not put all your eggs in one basket. In another speech in August, 1921, in the Indian Merchants' Chamber, your Excellency stated that experts always differ from one another?

A.—That is so.

Q.—Is it safe to trust all your scheme, and everything, to one expert; that is the point?

A.—You must trust somebody. You must take the best opinion you can and then support it and back it up. That is my experience in life. You cannot hesitate. I also suggest to you that you must have a little reasonable courage in these matters?

Q.—That is true.

A.—I think we were amply justified in choosing Sir George Buchanan on the information before us. Until this Inquiry is over I have no reason whatever to change my view. I support all those people who worked so loyally during my administration. I wish particularly to make a point of it.

Mr. Billimoria.—Did all the members of the Government of India recommend Sir George Buchanan, or was there any difference of opinion?

A.—I am afraid I do not know what went on in the Government of India.

Sir Frederick Hopkinson.—Do you really consider that Sir George Buchanan worked loyally?

A.—Is not that rather a leading question?

Q.—It is a very leading question. It is after what you said just now. If you had not said what you said just now I should not have put the question.

A.—I think that is scarcely fair after the question is put to me.

Q.—Then do not answer it.

A.—As it has been put I have to make some answer. That is the unfortunate part of it, if I may say so. The question having once been put I can hardly leave it, because an innuendo is caused. It is very hard on Sir George Buchanan.

Chairman.—Will you take it down to your period in 1923?

A.—I am afraid that I must deal with it as the question has been asked.

Q.—Will you continue?

A.—With all regard to Sir Frederick Hopkinson's opinion ——

Sir Frederick Hopkinson.—I do not mind.

A.—But I am thinking of Sir George Buchanan, who has not had an opportunity yet of coming here. I was merely trying to say that it is my duty as the late Governor to give my support to all those who worked for me, and for whom I have the greatest regard. There was Sir Lawless Hepper.

Q.—You said, " Who worked so loyally " for the Government?

A.—I have no reason to think that they have not worked loyally for the Government. On the contrary I am grateful for the loyal service of everybody, Sir Lawless Hepper and all concerned, and until it is proved to the contrary I give them my support. I want that to be known.

Sir M. Visvesvarya.—That answer, if I may so, does credit to your Excellency's heart.

A.—And also to my brain, I venture to suggest. I take all responsibility. I take the fullest responsibility for the whole administration during my period of office. I

share that with the Secretary of State and the Government of India. None of my officials can be blamed for anything that happened. I take full responsibility. First of all, I am very proud of this Scheme, and I believe that if driven to a conclusion it will be for the vast benefit of Bombay even at the prices to-day. I desire to see it driven through. Above all I desire to support the loyal and devoted services which I have had from my officials, and I include in that until it is proved to the contrary my engineers.

Sir Frederick Hopkinson.—You do not take responsibility for the technical details of the scheme?

A.—No, I cannot do that.

Q.—That is what I mean. I am going into the technical details of the scheme?

A.—Few people have been served as devotedly and loyally as I have been by my officials. I will not see them criticised while I am here. I take full responsibility for all their work.

Q.—But not for the technical work they did?

A.—Sir George Buchanan is a technical adviser who is paid, and he is different to my officials. He will have the benefit of my loyal support until I can be shown that he has done anything against the interests of my Government. That has not been shown until the report of the Committee is out, and until it is shown, he is entitled to that confidence which I give him. That is all that I have to say. If I speak with a little heat you will forgive me, but I have been fortunate in having very fine officials.

Chairman.—You have put it in the most correct and proper manner, and the only way in which it can be put, that everybody who worked for you has your loyal and determined support until facts are brought to your attention and conclusively proved which show that in any particular instance that support ought not to be continued. That is the position.

Sir Frederick Hopkinson.—It is a point of view with which I entirely agree.

Chairman.—We must all agree with that.

Sir M. Visvesvaraya.—We are all agreed.

A.—I am sorry if I spoke with a little heat.

Sir Frederick Hopkinson.—I think it is a most excellent way to look at it. I could not wish you to put it in a better way.

Sir M. Visvesvaraya.—We are now concerned with things which have gone wrong. It is in connection with that that these questions arise. Sir George Buchanan in his specifications for the dredger has put soft clay in place of hard clay. He has put soft clay where he should have put hard clay?

A.—You make that statement; I cannot accept it. He can speak for himself.

Q.—Another statement made is that in placing the order there were no proper guarantees to ensure that the dredger gave the required output. The dredger has failed to give even 40 per cent. of the output promised, and now somebody must be responsible for the failure. You would not object to our inquiring who was responsible, and how it came about?

A.—I am here to show you that I welcome every necessary inquiry, but I cannot accept a whole series of statements made by you, Sir M. Visvesvaraya, in the course of conversation, and I cannot be led to accept them. I have tried to answer a great many cognate questions. You say that the dredger has failed. You say its output is so much. I must not be held to agree with you. I must be careful about my replies.

Q.—Shall we place the necessary reports before you. Your Excellency must have seen the papers?

A.—Which papers?

Q.—The reports?

A.—I am afraid that I have not read all the reports.

Q.—We can give you any facts or figures you want?

A.—If there is any specific point on which you want my opinion I will certainly try to give it to you if you ask me.

Q.—I suppose you are aware of the fact that the dredger is not giving the required output?

A.—I have not seen any papers, but I have been informed that the dredger during the last two years since I left has given an extremely disappointing output. I have not been informed as to why that matter was not corrected at a very early stage, because it was so important. I have been informed that since the bonus, for instance, to the crew, which is only information that I have got second hand, has been settled the output has been very much bettered, to what degree I do not know. I have a great many responsibilities other than that at the moment, and I cannot deal with two things at a

time, I am afraid. More than that, I have no information, but I think you have it, so that I do not know that I can assist you in that matter.

Q.—Of course, the dredger did not begin to work till you left?

A.—It was a day before I left, I think, to be accurate. Whether it functioned the whole day I do not know.

Q.—I am coming to another point on which probably you might take a different view. Did not the Government weaken the efficiency of control by creating the new department and by superseding the Public Works Department?

A.—No. On the contrary it did not supersede anything, and I think it added to efficiency. A good many Public Works Department officers wherever suitable were appointed, and the new department was absolutely essential to the carrying out of the co-ordination of the various housing schemes in the suburban as well as the urban area of Bombay. The task, very complex as it was as regards land notification, as regards the driving of great thoroughfares, as regards the reclamation, and as regards actual housing, was not one that any ordinary Public Works Department could possibly have taken on its shoulders. I am very glad that you asked me that question, as I should have forgotten to have given you some of the reasons which may interest the Committee as to why we set up that department. As I have no doubt you are aware, the question of giving a contract for Back Bay was considered. There was no firm of Indian engineers who were nearly large enough or competent to carry out so large an undertaking, and with the national feeling that was running so highly at that time the outcry which would have ensued if the Back Bay contract had been given to a British firm of engineers, or a foreign firm, would have made it impossible for us to raise the money on the loan market in Bombay. There was at that moment a very highly political movement which would have ruined all chances of our raising the necessary funds for the purpose. Therefore, it was decided that the Government was the best agency. The Government is as a rule not the best agency for those purposes. Ordinary commercial enterprise in my experience is almost always better than a Government for those purposes, but in these particular circustances there was no alternative. What was then the next best best thing to do? We could not put this huge task upon the Public Works Department for the reasons that I have already adumbrated. We desired to get a Department responsible to Government, but working—I say it with no disrespect to Government—with perhaps rather fewer red tape methods in some respects than Government, but with no new authority; something on the lines of the relations the Munitions Board had to Government during the War. The new Department had no new powers. I desire to emphasise that. It did not interfere with the local bodies in Bombay City, nor did it assume fresh powers over local authorities in the suburban area. The existing rights of local self-government were unimpaired. In internal organisation it also had no special powers. It was subject to the same codes of Regulations as the Public Works Department, and other Departments of Government. Its technical personnel was largely temporary, but the Public Works Department itself engages large numbers of temporary engineers when large schemes like the Sukhur Barrage are in progress. So far as men were available and suitable, the resources of the Public Works Department in personnel were utilised, and several of the higher staff, including the first Chief Engineer, Mr. Lewis, of the Reclamation Scheme, were permanent servants of Government in the Public Works Department. On other D. D. schemes were Mr. Harvey (Chawls), Mr. Browne (Suburbs), and Rao Saheb Advani (Suburbs). Two important modifications of the usual Government organisation were made to secure effective financial control. Financial control was in the first instance exercised through a special Financial Adviser who was an officer of the Government of India. In the second instance all payments were subject to pre-audit so that any irregularity was checked before it could be committed. For accounts and audit a specially selected officer of the Government of India was appointed. For these reasons, as well as a great many of a minor character with which I will not weary the Committee, I do not think that the setting up of this Department was an improper thing to do, or that it in any way weakened or impaired the machinery; in fact, I venture to think that it was exactly the contrary, and that was the reason we set it up.

Q.—The general feeling is that to maintain sound practices it would have been a great advantage had the Public Works Secretary been associated with the scheme?

A.—Your most praiseworthy loyalty to your old Department must not lead your heart to govern your head in this matter.

Q.—I left the Department eighteen years ago?

A.—But " absence makes," &c., I think. Anyhow your loyalty is obvious, but you must be a little more hard headed about this proposition than apparently you are. We used, as we consider, the best parts of the Public Works Department, and we grafted them into another Department specially framed to grapple with this large variety of most complex problems It was the best machinery, as I still think to-day. We all make mistakes, but I do not think that was a mistake. I can conceive of no better organisation

than the one we did set up for this purpose. You must remember, as I say in conclusion upon this point, that this is probably one of the biggest and the boldest housing schemes that has ever been conceived. It was done because there was a necessity to meet. It was or is an extremely complex and difficult thing to do. You cannot expect perfection anywhere. I do not suppose there has ever been a more difficult housing problem except, perhaps, in New York, and there the local conditions were easier than this Bombay housing problem. The mere fact that it defeated all my predecessors shows that it was no easy task. Peculiar circumstances demand special measures. This Development Department was one of them, and I desire to defend its position very strongly before the Committee. I think it was the best that could be done, in the circumstances.

Sir Frederick Hopkinson.—The ultimate test will, of course, be the results, will it not?

A.—That is right.

Q.—And the only reliable test?

A.—That is right.

Sir M. Visvesvaraya.—It has not yet showed that it has succeeded?

A.—Nothing will be finally proved until, I suppose, the Judgment Day. In this case not until another ten or twelve years, I should think, will the vindication of these schemes come, and, indeed, probably not for longer. Very few of us have the good fortune to have our big works vindicated in our lifetime. I am quite confident about the future of this one.

Q.—We have had three witnesses here, Sir Henry Lawrence, Sir Stanley Reed, and Sir Sidney Crookshank. All of them were in favour of Public Works Department organisation. There is a difference of opinion, I suppose?

A.—I cannot say that even, because I do not know their views.

Q.—They have said that the Public Works Department would have done better?

A.—I am afraid that I cannot accept anybody's view as preferable to our own, because I do not believe anybody had greater experience than those of us who were governing, and who knew the machinery perfectly.

Q.—These gentlemen have had many years' experience?

A.—Very great experience. There are probably few men who have had a greater experience of Bombay, generally speaking, or a more intelligent one, than Sir Stanley Reed, but I could not even accept him as an authority as regards the machinery in Government. I have been inside it for several years, working about 14 hours a day, and I think I must know more than Sir Stanley Reed, even. Mr. Ewbank and I, probably, know more than Sir Stanley Reed about it.

Q.—Then the Consulting Engineers and their agents in Bombay were made responsible for the purchase of plant and machinery?

A.—To whom do you refer as the Consulting Engineers?

Q.—Or the Engineers, Messrs. Meik & Buchanan?

A.—Yes.

Q.—They were the Engineers, and they were interested in the purchase of plant and machinery in England. There was no Government officer who scrutinised their indents?

A.—I am afraid that I cannot accept that. Are you making a statement, or asking me a question?

Q.—I am asking why this happened?

A.—But it did not happen.

Q.—I am asking why it happened that the purchase was entrusted to a private firm?

A.—I have explained already how purchases were made, partly by the Stores Department, partly by the High Commissioner in India, and partly by the Bombay Government, but practically, not at all by the Bombay Goverment, as far as I know, except the local materials which were required for Back Bay. It was done, practically entirely, I believe, by the Stores Department, or through the Stores Department. I expect that there has been some evidence about that?

Q.—Yes.

A.—I have not made a note of that. Anyhow, I saw nothing of that. That was all done by the Directorate Department.

Q.—Why was the purchase of plant and machinery in England entrusted to the firm of Meik & Buchanan entirely, and why was not supervision exercised on behalf of the Government by any technical officer?

A.—I am afraid that I cannot understand the question. I must not accept those as facts. I cannot even understand the question. Can you put it more clearly?

Q.—Messrs. Meik & Buchanan are a private firm. Orders for the purchase of machinery and plant in England were entrusted to them. They selected the machinery

and prepared the indents, and sent them up to the Director-General of Stores, and that officer ordered them on the authority of the High Commissioner.

A.—If I may interrupt you, you do not suggest, do you, that Director-General of Stores should have chosen what kind of machinery Sir George Buchanan was to use in Bombay. Sir George Buchanan had to indicate what he wanted, and then it was ordered through the proper official channels, so that the thing should be properly done. I cannot conceive anything improper in that.

Q.—The Director-General of Stores merely placed the order?

A.—What else should he do?

Q.—The indent for materials should have been examined by a permanent officer of Government before it was passed on to the Director-General of Stores.

A.—Do I understand you to make the criticism that the stores ordered by the Stores Department in England were never properly examined?

Q.—Their duty was merely when an order came to see that the materials supplied were good. That was all right, but the tenders were invited by Messrs. Meik & Buchanan and placed before the Director-General of Stores. He had merely to sanction a contract accepted by Messrs. Meik & Buchanan. They recommended a certain firm and, unless he had any serious objections, the order was placed in their hands. My point is, that the Government entrusted purchases of enormous value to a private firm without any supervision on their behalf by a Government technical officer. If it had been the Public Works Department, some officer or other would have done this. In this case the Government Director did not attend to this essential duty.

A.—If that concludes the statement—it is not a question—I cannot agree that the Government did leave the whole purchase of important material to a private firm in London without supervision. My information is that the stores were bought in a proper manner by the proper authority, and, so far as I know, with proper scrutiny. Anyhow it is entirely outside the orbit or ambit of my activities. I am most anxious to give you all the information I can, but it is nothing whatever to do with me. I do not know anything about it. It was all done in London.

Q.—I am coming to the point that your Excellency selected a firm of engineers and entrusted everything to them?

A.—I did not select. My Government selected a firm of engineers. Having consulted our experts we did give them our confidence. It was nothing personal. It was the Governor in Council.

Q.—We do not suggest that it was personal.

A.—I have given you all the reasons for the appointment of Sir George Buchanan, I hope, quite clearly.

Q.—As regard the organisation, we find that the duties of the Development Director, and of the Engineers were not properly defined. The result is as the evidence before us shows that the Development Director divested himself of all responsibility for technical work. Messrs. Meik & Buchanan visited the works only occasionally, and the result was a policy of drift. Things tended their own way, and there was not definite control. The Development Director has stated that he had no responsibility for technical work, and the technical advisers were not in Bombay but in London. Even Mr. Lewis yesterday admitted that it was not a satisfactory arrangement, and that was one of the reasons why things drifted.

Chairman.—Are you basing your question on the evidence?

A.—I must not be taken as accepting any evidence.

Sir M. Visvesvaraya.—The work was started in a hurry, and much of the correspondence has been unofficial or demi-official. We were told in Bombay that some of the correspondence has been brought here by your Excellency. Is any of that correspondence available?

A.—I am afraid that I do not understand you. What were you told in Bombay?

Q.—We were told in Bombay that much of the correspondence on this subject, where the work was done in a hurry, was unofficial or demi-official?

A.—I should like to see evidence of that, if I may. I do not understand it.

Mr. Billimoria.—Some files had been taken away by your Excellency when your Excellency left Bombay?

A.—Who stated that I took any files?

Chairman.—I was not present, but I think it was only your Excellency's private file?

A.—I should like to be quite clear. Is it suggested that I have abstracted my file?

Sir M. Visvesvaraya.—No, your own files. It may be usual to take away files?

A.—It is certainly never usual to take what is Government property.

Q.—Demi-official correspondence and unofficial correspondence?

A.—No, it would be most improper to take any of the Government files.

Q.—Then the information placed before us was not accurate?

Chairman.—Let us get what the information was, and then you can put the question.

Mr. Billimoria.—It is in Mr. Cowasji Jehangir's evidence.

Chairman.—Would you proceed to some other question?

A.—I should like rather to clear this up, because I am not quite sure of the tenor of Sir M. Visvesvaraya's question, and I do not want to leave it there.

Q.—That is why I want to see what was said?

A.—I want to know what Sir M. Visvesvaraya means.

Sir M. Visvesvaraya.—What I mean is that the work was done in a hurry.

A.—What work was done in a hurry?

Q.—The scheme was got into existence in a hurry?

A.—I do not agree.

Q.—Much of it must have been done by demi-official and unofficial correspondence.

Chairman.—Lord Lloyd does not agree that it was done in a hurry. You had better question him on that if you want to get it as a basis for your question. He does not agree that it was done in a hurry.

Sir M. Visvesvaraya.—The general public accept that.

A.—I am afraid that I do not accept the general public view. On the contrary I think the general public are very stout supporters of this scheme. Their representatives unanimously sanctioned it in the Legislative Council. They are not very vocal, but there are a good many thousands of them, and such evidence as we have is strongly in support of this scheme.

Q.—We want to consider the views of the vocal people also?

A.—Quite so. Perhaps you would know what exactly you did mean by that question.

Q.—The statement is in the evidence. I am only basing my question on that.

Chairman.—You must read the evidence. I am trying to find it. I thought it was in Mr. Cowasji Jehangir's evidence?

A.—I will give you the answer, because the answer is perfectly simple, but I should be obliged if you would kindly let me know what the original of that question is, and what was meant by it? Of course I have no papers that do not belong properly to me except my private correspondence and private telegrams, but the question being asked in that manner I shall be glad if you will get it withdrawn if it was put in that manner.

Chairman.—This is the question. "Are there any files missing?—(A.) Not missing. (Q.) Any records on the private files of the Government House about the inception of the scheme?—(A.) Sir George Lloyd, I believe, had a private file; he must have written demi-official letters; we have not got those. He has taken away a good deal of private correspondence with him. We have not got them all. (Q.) Anything that you have left here that would help us?—(A.) I have not got all those letters. Unless I read them I cannot say whether I can help you."

A.—Do you suggest, Sir M. Visvesvaraya, that the private letters of the Secretary of State and myself should be given to any outside body? It has never happened yet as far as I know. It is most improper.

Sir M. Visvesvaraya.—He replied that some of the correspondence was unofficial correspondence?

A.—Do you ask me whether I have in my possession public documents which I should not have?

Mr. Billimoria.—Will your Excellency kindly read the question?

Sir M. Visvesvaraya.—Yes. Personal and official letters on this subject. We want to know whether we can see them?

A.—I should have hoped that it was unnecessary for you to ask me that question at all. I have given you the reply. Of course I have no files which do not properly belong to me. I have private correspondence.

Q.—We accept that answer.

A.—I do not quite understand why the question was put.

Q.—The question was whether the file referred to there had been brought here. Who made the appointments for the reclamation works generally?

A.—Am I aware who made the appointments?

Q.—Yes?

A.—Yes, I am.

Q.—Who made the appointments?

A.—I have already given evidence to-day to the Chairman of the Committee when I was explaining the composition of the Development Department. Do the Committee desire that I should go through it again?

Q.—No.

A.—Some appointments were made in London and some were made locally, and some from the Public Works Department.

Q.—May I ask why some of the Public Works Department officers were not employed?

A.—I could not give you the reasons why any particular officers were not employed at this time. It probably never came within my purview. It would have been most improper if it did. I had more important things to see to than personal appointments. It was left to the director and other officials.

Q.—It was said also that the appointments were left to the firm of engineers?

A.—Certain appointments were made on the nomination of Sir George Buchanan; others were left to the director.

Q.—What is suggested is that the engineers were given unusual latitude to handle Government purchases and appointments?

A.—If that is suggested I do not agree with the suggestion.

Q.—It is also suggested that the engineers were not themselves controlled properly by Government?

A.—May I ask you by whom it was suggested; what is the authority?

Q.—The public?

A.—Has it been given in evidence?

Chairman.—No, it has not been given in evidence. None of these matters have really been given in evidence.

A.—That is why I was wondering whether we must go outside.

Q.—They are not in evidence at all?

A.—I was going to ask your ruling, Mr. Chairman, as to whether it is necessary to go outside to general rumour.

Chairman.—My opinion is very definite that nothing whatever except on the evidence is material.

Sir M. Visvesvaraya.—I only want to go into one other matter.

A.—If we are going to put every absurd rumour about this or that appointment we shall never finish.

Q.—We want to know the truth about them?

A.—I am very anxious to give it.

Q.—That is the best way to dispel wrong impressions?

A.—Will you kindly put your question? I am trying to answer it, but perhaps you could confine yourself to something better than a rumour.

Q.—When funds were being canvassed it was said that the work was in Bombay, for Bombay, and by Bombay. One of the witnesses before the Committee has stated that out of 20 posts at a salary of Rs.2,000 and upwards, 19 were non-Indians. We asked for a contradiction of this statement in Bombay, but none was forthcoming. I wish to bring that to your notice. Have you any remark to make?

A.—If you will kindly put me a question it will assist me very much.

Q.—The question is, your Excellency has stated that you are anxious to encourage local firms?

A.—Yes.

Q.—Can you tell us to what extent that promise has been redeemed? This individual witness says that out of 20 posts carrying salaries of Rs.2,000 and upwards, 19 were non-Indians, and only one Indian?

A.—Indian engineers and Indian personnel were appointed so far as was possible without in any way damaging the taxpayers' money. If it came to a question of politics at the expense of the taxpayer my Government would probably think that improper. Appointments were made on their merits, and with a view to having as many Indians as we gradually could, and a very considerable number, much more than those which I think came in your figures, were employed on the whole housing scheme; it was a very large number.

Q.—This statement was taken from the reply given on behalf of the Government in the Legislative Council, that 19 were non-Indians out of 20?

A.—In what year?

Q.—I cannot give you that?

A.—It may have been so at the beginning, but I do not think it was so later.

Sir Frederick Hopkinson.—After what you have said as to so many of the questions being technical and rather outside your province, and as I am mainly interested in technical questions, I think there is nothing that I care to ask you.

Mr. Billimoria.—I will not keep your Excellency very long, but I shall be obliged if your Excellency will answer a few questions which will clear the atmosphere of doubt which exists in the mind of the public in Bombay. Your Excellency agreed to undertake the work of reclamation believing in the reasonable accuracy of Sir George Buchanan's estimate?

A.—In the accuracy of Sir George Buchanan's estimate.

Q.—It has been suggested that Sir George Buchanan's services have been of very little value, and that the result of relying on his advice at the commencement has proved financially disastrous. Has your Excellency any remarks to offer to that?

A.—I have nothing to say, except that all those like Sir George Buchanan who were retained by my Government to carry out this work certainly retain my confidence until anything is shown which will cause me to retract that confidence. That has not occurred up to date, and therefore my answer is that I cannot agree to that statement about Sir George Buchanan. He has had my confidence.

Q.—That is a statement made by the present Government?

A.—I wish to make no comments on the attitude of the present Government of Bombay. I think it is entirely unsuitable for me to do so.

Q.—Did your Excellency's Government consider it safe to accept an expert's report which was made within a period of two or three weeks of that expert arriving in Bombay?

A.—Yes, in the circumstances we certainly did. You must remember that a very, very great deal of work, as has been pointed out, was already prepared, and for the reasons I think I have already given in evidence we did consider that it was perfectly proper to act as we did.

Q.—Did Sir George Buchanan at any time suggest to your Excellency, or to your Excellency's Government whether an independent investigation or survey was necessary before the scheme was launched?

A.—I am not quite clear as to your question; a survey of what?

Q.—Some borings being taken, or an independent survey being made before the scheme was launched?

A.—No, I do not recollect his giving me any such advice. If Sir George Buchanan advised me that fresh borings were necessary before he gave me expert advice, naturally we should have accepted his advice at once. I do not recollect that being done. Sir George Buchanan, Lord Sydenham and others considered that the work done by Mr. Kidd on the borings was amply sufficient and good.

Q.—No member ever suggested to him that he should accept Mr. Kidd's figures as accurate and reliable, and base his estimate on those figures?

A.—No. We were not acting as advisers to Sir George Buchanan. Sir George Buchanan was acting as adviser to us.

Q.—That fact has been proved from the very nature of the reference made by Sir George Buchanan as to the practicability of the scheme from an engineering point of view—" the suitability of the type of wall proposed with alternative suggestions for better types, and the suitability of the proposed method of reclamation by means of dredging or alternative proposals for same."

A.—So careful was I not to dabble in matters with which I was not competent to deal that I included in my despatch to the Government of India words to the effect that I could express no opinion on the technical side of the matter. The way to get on is to choose the best man and trust him.

Q.—It is some years since you left Bombay, but I am quite sure that your close connections with that city must have given you some idea of the fact that the conditions there to-day are not entirely the same as they were in 1919. We are passing now through stress of depression in commercial activities.

A.—I am sorry that is so.

Q.—You must also be aware that several syndicates and public companies which were floated in the boom time have come to grief in recent years?

A.—I have heard rumours of that, yes.

Q.—Therefore, merely because two very powerful syndicates came forward and supported the launching of a scheme of such vast magnitude as this, does not indicate that they considered it would eventually prove to be a financial success. Nobody could be a prophet?

A.—No, but you are not suggesting, are you, that those gentlemen in those syndicates were insane? I should be very far from suggesting anything of the kind.

Q.—I do not suggest anything of the kind. They were the very best business men, but it is the fact, is it not, that some of those business men have burnt their fingers very badly during the last few years?

A.—That is so. The only inference I draw from it all is that it was reasonable to suppose that able business men of that period, outside Government, themselves believed that the scheme was likely to be a commercial success. I must remind you here that the Government was never for a moment taken up with the question of the commercial success as such of Back Bay. It was not put forward because it would be a commercial success. It was a contribution to the whole housing problem and a necessary and an essential corollary of it.

Sir Frederick Hopkinson.—It was stated that it would be a huge financial success?

A.—Precisely. I was one of those who hoped it would be, and I have not given up hopes yet. If it is pursued without irresolution, and if it is carried on actively and with strong handling, the scheme can perfectly well be a great success still. I should take too long to tell you all my reasons for thinking that, but at the end, if I may, I will give you a few of them. What kills any scheme of this kind more than anything else is irresolution and halting. When you have large sums of money out, get on with the job, and do not talk about it. It was necessary in this case—and I accept the fact—owing to public anxiety (the origin of which, and how it was allowed to grow up, is another matter) an enquiry of this sort was presumably necessary. Normally speaking, however, delay kills a scheme of this kind. That is what we have to consider.

Mr. Billimoria.—With regard to the remarks which have fallen from your lips, may I remind you of the despatch which you sent to the Government of India in which the words are used: "It is evident that the proposed scheme will be immensely profitable to Government." Therefore, you and your Government at the time did fully believe in the financial success of the scheme. I agree that you are not responsible for the subsequent results.

A.—I am not prepared to accept responsibility for the delays which may have occurred since I left, or for any faults of the administration, since I left. I do not desire to express any opinion on it; it has nothing to do with me. I still think, however, that, properly conducted, the scheme is likely not only to be of vast indirect benefit to Bombay city (I think it is vital), but I think it is perfectly possible to make it a commercial success in spite of the increase in cost, and anticipated increases.

Q.—I want to bring out one fact, namely, that the Secretary of State and the Government of India were induced to sanction the scheme because of the statements made by your Excellency's Government to the effect that it was going to be immensely profitable?

A.—No, Sir, I am quite certain that the Government of India and the Secretary of State were not misled on that point. The scheme throughout was advocated and urged as an essential part of the housing scheme, and it was as such that they accepted it. It was our bounden duty at the same time, in dealing with the financial side of it, to state what our anticipations and views were. I do not believe that the Government of India or the Secretary of State decided to do it because there was going to be a profit on it, or because they believed there was going to be a profit on it. It was done because it was essential to the problem. It was an essential concomitant ancillary to the others. One could not be done without the others.

Q.—If the figure had not been 367 lakhs, but had been three times as large, do you think the Secretary of State would have been induced to approve of the scheme?

A.—That is a very hypothetical question. I cannot give you a definite answer. Much depends on the state of the cotton industry and whether the mill owners are going to put their mills in order and conduct their business on modern lines. Much depends on the tariff question, and other things. The whole of the future of Bombay is bound up with it. I am not prepared to give a definite answer to your question, but I should certainly have been content to have put forward that scheme at a considerably higher figure than 4 crores.

Q.—Having regard to the political situation then existing, the military requirements in the Colaba area were of vital importance?

A.—I will not say vital. If I used the word "vital" I overstated it.

Q.—You used the word.

A.—If I did I will correct it and say "of very great importance." In times of great stress you naturally look to the disposition of your troops perhaps with a keener eye than in quiet times. In any case it was most improper to house troops worse than animals. It was disgraceful.

Q.—That was one of the reasons which led to the Back Bay scheme?

A.—That was one of the contributory factors in our decision.

Q.—You were aware, during the period of your office, that there was a large area of land available in the city, in the northern part of the island?

A.—I was, yes.

Q.—It has been suggested that when there were lakhs of square yards of land ready for building, it was unnecessary to take on this huge scheme. Why was it undertaken? Was it for somebody's benefit, or was it going to benefit the masses?

A.—It was for the benefit of the people as a whole. I think the point you wish me to answer is this, is it not : Is Back Bay any real contribution to the housing problem?

Q.—Yes, that is the point.

A.—Could not the people have been housed just as well, and could not the problem have been solved, without Back Bay? I do not think it could. In a public speech of mine you will find that I stated how grave were the hesitations of anybody who had to take up a scheme which had had such a chequered career and after so many attempts in regard to it had been made; but every expert opinion was to the effect that it was essential to the problem in hand. It was not so much an actual vital necessity to the industrial housing problem in itself, as an essential concomitant. I hope to give you some of my reasons for stating that. I should take too long to give them all, but I hope some of them will be enough for the Committee. First of all, congestion existed in the Fort as well as in the industrial centres. We were dealing with a completely congested area. If you doubt that I will give you evidence of it. Open spaces were urgently required. They could not have been provided, for instance, in Salsette, because the traction did not exist. The distances were too great. Furthermore, the malaria question, especially in parts of Salsette, was very grave. The malaria chart ruled the whole of that area out. We had a special enquiry into that. Another reason is that the housing problem is a fluid problem. Relief in one quarter produces relief all down the line; that is to say, if you erect buildings of an office character on Back Bay, you are going to relieve the office area in the Bazaar, and other people are going into that area and get better housing than they had before. Another reason was that the Government was working not only to catch up, but to overtake the congestion problem in order to meet not only existing needs, but, while the machinery and organisation was at hand, to try and meet as far as possible, in a very modified way, reasonable future needs, so that we should not be caught again in the terrible vortex in which we had been caught for the 10 or 15 years before. Then there was another reason of which far too little, I venture to think, has been made by witnesses at this Committee. Perhaps they were not as aware of the problem as those of us were who had to study it closely. The essential need of this scheme is destruction and not construction. I do not wish to discuss the policy of the present Government of Bombay at all, but I may tell you my views as the author of the plan. We were out to try to remedy gross insanitation and over-crowding. For years before I went there we had tried to get the Bombay Municipality, for instance, to set up by-laws to give us an angle of light and air fit for human habitation, but never would they set up those by-laws until I practically drove them to do so. I say it in no disrespectful sense, but by the urgency of my plea (I will put it in that way) and, indeed, by their shame, I think, that they had not done it before, and by hammering at it always in public, eventually we got the angle of light and air, which was necessary to human life, agreed to. This Committee can scarcely appreciate the appalling conditions in which people were living. They were living in worse conditions than any animals could live in. Heroic measures had to be taken. Destruction was therefore one of the essences of the problem. We had to consider in my plan (which must be before the Government to-day), driving great roads and clear spaces through some of the most crowded parts of the present-day Bazaar. It was not possible to notify to the public all our plans of destruction years before we could take them up, because it was necessary in each area to notify to that effect. Some of these blocks are on very valuable land. We could not make all our plans public; the prices would have run up fantastically. The public are not aware to-day of what our destruction plans were. Some destruction has taken place. I drove out great roads to the north to give the first traction out and back, and in order to assist the electrification of the railways which I produced afterwards on either hand. When I first went to Bombay, on the western side of the island there was only a little narrow lane winding through palm trees. Yet that was the main entry into Bombay and the main causeway. You know now that great avenue leading into the city from the G.I.P. causeway. What was it when I first went out there? There was no great avenue of traction down which you could get the people in and out quickly. There to-day is a great trunk road. The first part if it had just begun when I went there and I did not see its ultimate completion, but I am sure it must be completed now. But even that road ends up against a block in the Bazaar, through which we cannot afford to penetrate yet, before it reaches the open sea. Therefore when you refer to the Back Bay problem, as I refer to it, as an essential concomitant, it is because people have not realised that if we are to carry out our purpose and make that city worthy of our rule in India, destruction has got to go on. Destruction has to continue if we are to breed up a race of healthy children instead of the feeble children which are now born there. We have got to destroy, and destroy widely, and during that decade of destruction you will find that not only the chawls which are being built now, but which have been built, will certainly fill up. I have no hesitation in making the prophecy that directly trade revives all those chawls will fill up,

and that an excess demand will come. The moment the mill industry revives, the moment the mill-owners put their house in order, and the moment Japanese competition is fixed by a tariff perhaps, then the Maratha population will come rushing down again to the city, as we have seen decade after decade. It has always been the same story. Remember, never once in the history of Bombay's expansion has the tide ever receded so far as it came in. Each time it grows and grows. Fluctuations occur; you get this tremendous expansion; then the tide recedes for a while, but the high-water mark is always left higher. Let me give you another reason——

Q.—Before you proceed to your other reason, may I interrupt you to ask you whether these working classes to whom you have been referring were expected to go and live on the reclaimed area of 1,145 acres?

A.—I am afraid I must have explained myself rather badly. I have tried to explain that it is a fluid problem. In trying to solve it you cannot only cater for one class of needs; you have to cater for all needs. It is absurd to suppose that the mill-hands would go to live on Back Bay. There was congestion of that class of population. There was also the fact that one day we should have to destroy, which would then create a demand for more and more office accommodation; and into some of the areas which were vacated in the office area, the lower class of workman would go and have better habitations than they had before. We made provision for industrial housing in one area; for commercial housing in another area, and for the middle classes in another area. We tried to connect those up with great roads, and by electrification, in order to solve the problem. We followed the experience which had been gained in other suburban areas in order to achieve our object. We studied the problem of Liverpool. If you do the same you will learn exactly how many miles you can afford to take the daily bread earner to and fro economically. If you want to relieve congestion in the city you take him out as far as you possibly can economically, but if you take him out beyond a certain point it means something additional on top of his wages, which indirectly his employer has to pay, which means another tax on business, and so on. There is a limit to which you can do that. The limit in Bombay Island was laid down by virtue of climatic and other conditions—the putting down of drains and so on, which owing to municipal discussion (I will put it in that way) proceeded very slowly. One of the great drawbacks of the housing scheme to-day is the drainage question, which has hung fire in the Bombay Municipality.

There is one other matter of a general character. As you break up slums you have to expand somewhere else. The people are turned out from the places you destroy. You have to provide for an extension due to natural development of trade and industry and also due to the growth of population. After consultation with a very great many people who knew a great deal about this question, and after reading an infinite amount about housing, we took the course we did, and I am quite convinced to-day that it is the right course. No doubt minor mistakes have been made, but, broadly speaking, I believe that what we have done has been for the lasting good of the city. Without it there would have been a ghastly scene in the last few years, and if this scheme is not pursued to its end it will, I think, be very serious for the repute of the city.

Q.—We want to know what made your Excellency launch this scheme. Does your answer imply that there was an immediate necessity for 1,145 acres of land in the reclaimed area?

A.—Yes, I think so on the whole. That is a very fair question, if I may venture to say so. The balance was 452 acres; that is to say, the military at Colaba were to take about 265; open spaces 187 (which I thought was too small a figure) and roads about 240 acres, leaving about 452 acres, or 22 lakhs of square yards of building land. I do not suppose I ever thought that all this land would be taken up immediately. It would be a gradual process. I do not think that, given reasonable trade, it will hang fire very much. Then there is the pressure from the ruling Princes, which may or may not have been mentioned here, for sites in Bombay. That is a political matter which perhaps I ought not to enter into, having left India, but there will be a great demand. There is no doubt the demand will be very great, and must be met from Back Bay. I think the open spaces ought to be greater. I hold very strong views about that particular question. I think you will find that the Bombay people desire above all things to get hold of a piece of Bombay land. Once the land is there, I am certain you will find it will be taken up much more rapidly than anybody thinks. We have seen these things happen so often.

Q.—I very much appreciate your emphasising the necessity for open spaces. That question has been neglected for a long time. I believe your Excellency still desires that there should be sufficient open spaces for the better health and amenities of the city of Bombay?

A.—Very much so.

Q.—Those open spaces could only be provided in the reclaimed area?

A.—That is right.

Q.—There is one point which has been suggested with regard to this reclamation, namely, that our heads were turned in boom time, and, now that we are passing through a period of depression, we ought, as ordinary prudent business men, to have thought in 1919 that the boom was not going to be permanent.

A.—Are you sure that heads have not been turned on both occasions? Those of us who tried to steer our very difficult ship, tried to take a long view over a period of years. I believe probably nobody has " bumped up " against such a cyclone of post-war finance and its difficulties. No one could tell, for instance, that the Government of India were going to stabilise the rupee at 2s., when it fluctuated from 1s. 4d. to 2s. 11d. in a few weeks. Such a thing does not make it easy for those who are conducting big operations of this kind. We may have under-estimated a little the depression. If you want to know the figure, we took 15 years for the depression. We may have under-estimated the gravity of the depression; I think probably we did, but I am not so sure that our estimates are going to be so very wrong, provided you go ahead and have a little courage and do not stop half way. I have great confidence that this will be successful. My answer to your question is that I think the tendency has been to take an exaggerated view in both periods—both the boom time and the depression time.

Q.—If you will pardon me, I will just make a few observations. Unfortunately I have been seriously misunderstood here. I have been understood as if I have been insinuating something against some of the witnesses who have appeared; but my only object in asking questions bluntly has been to put on the record the facts as they are, so that whatever misapprehensions may have existed in the minds of the public in Bombay may be dispelled or otherwise, and so that the various charges which have been made from time to time may either be substantiated or not. With that object in view I will trouble your Excellency to remark upon the charges which have been made against your Excellency's Government.

A.—I have not seen any, but I should be delighted to hear them.

Q.—There are charges made in this little book.

A.—It depends by whom they are made as to what value is to be attached to them.

Q.—Whether they are made by enemies or friends, I think it is very desirable that you should clear the ground. " Charges made. The mildest form of charge is that the scheme was pushed through with undue haste and sanctioned without a sufficiently careful examination in its engineering and financial aspects."

A.—I think I have dealt fully with that.

Q.—Yes. The second charge is " The scheme was launched mainly with the object of placing orders in England for expensive plant, and the employment in highly-paid positions of a number of Europeans." You will be the best person to say something about that charge.

A.—The only answer to that is that it is positively ridiculous. The whole history of our régime in India forbids such an interpretation by any reputable or honest person. The mere fact of the Secretary of State's own personal interest, and the fact that the Municipality of Bombay themselves begged us to take up these schemes at once when I first arrived, practically getting my promise before I had landed that I would take these up, gives the lie to that assertion. We did exactly what their own Municipal representatives asked us to do. Further, we did what their own Legislative representatives unanimously approved of. It is rather absurd, surely, to say that we did it for our own narrow British ends, and in order to get a few people a few more jobs. I do not think any serious person would consider that, would they?

Q.—The third charge is, " The order for the dredgers was decided by the fact that Sir George Buchanan received a large commission on the order."

A.—I am perfectly certain there is not a word of truth in that, but you will have to ask Sir George Buchanan himself about that.

Mr. Billimoria : You will understand that this is not a charge emanating from me.

Chairman : There has been not the slightest suggestion of it in any of the evidence at all. All that Mr. Billimoria is trying to do is to bring to your Excellency's attention some statements which have been made before this Committee.

Witness : I know Mr. Billimoria and his reputation well enough to be satisfied that he would make no such charges himself. He is only trying to do a public duty. I think you will find that Sir George Buchanan would very much resent such a suggestion, and very properly resent it. He is in a position to give a definite answer, but I should deny it most indignantly from all I know of him.

Mr. Billimoria : Before you assumed charge of the office of the Governor of Bombay, I take it you had interviews with Mr. Montagu, the Secretary of State for India?

A.—Yes.

Q.—You had some instructions to go ahead with this scheme?

A.—I must be more accurate than that. I cannot say that the Secretary of State authorised me, and charged me straightly to carry out the Back Bay scheme. He charged me very straightly indeed to deal most urgently with the housing problem as a whole. I can show evidence, preferably to the Chairman, because there are some private letters, proving his complete approbation and keenness of the Back Bay scheme particularly, but he did not charge me to do that; merely with the general scheme.

Q.—The memorandum which was submitted to us did use the word that you were "charged"?

A.—I think, as a matter of fact, from an office note which I believe has been put before you, that the Secretary of State subsequently did say he charged me straightly to carry out this scheme; but in the early conversations I had with him, I cannot remember his emphasising the Back Bay scheme, although we discussed it. I cannot claim that he ordered me to carry out the Back Bay scheme more than any other. We discussed the housing scheme as a whole. We discussed Back Bay, and he gave me instructions to proceed to the examination and execution of such things as were necessary to solve the problem with as much speed as possible.

Q.—Did you know Sir George Buchanan before he came into contact with you in this connection?

A.—I do not think I can say I knew him, in the ordinary sense of the word, but I believe I actually met him in Basra during the War. I had no acquaintance with him.

Q.—This morning, in the course of your evidence, you mentioned that you left it to a higher authority to consider the technical aspect, but from the evidence which Sir Sydney Crookshank gave before us, he said he looked at the scheme only superficially and that he did not go into the details of the figures submitted in the report?

A.—I am afraid I cannot answer for what Sir Sydney Crookshank did or did not do.

Q.—But he was the higher authority to which you referred?

A.—I referred to the Government of India and the Secretary of State.

Chairman: You would be entitled to assume that the Government of India, its servants and agents, did their work with care?

A.—Yes, just as I hope this Committee will assume that my Government did the same.

Mr. Billimoria: It is also a suggestion made, both in the Press and by the public, that the dredger "Sir George Lloyd" was consigned to your Excellency in your personal capacity?

A.—Rather a big parcel!

Q.—That has been the suggestion, and I shall be very glad if you will clear it up.

A.—I never saw a package with any steel or iron. It certainly never reached me. It seems to me a most frivolous point. The name of the dredger was the "Sir George Lloyd," and I believe they always paint the name of the boat on packages. If anybody suggests that I was getting consignments of dredger steel addressed to me privately, all I can say is that I was not the happy recipient of them. It sounds to me a most frivolous objection. I cannot clear it up. You must ask somebody else. With all respect to the critics, it is a very absurd suggestion. Whether it is true or not, I do not know. The implication is ridiculous. I need not pay any serious attention to it.

Sir Frederick Hopkinson: I suggested, when we were sitting in Bombay, that the gentleman who made these various accusations ought to be prosecuted.

Chairman: Is there anything you would like to say in conclusion, Your Excellency?

A.—I want just to make sure that the Committee understand one thing. I expect you realise that the story which you are examining to-day is nothing new. It is not until one understands the history of the growth of this really very wonderful city by bold schemes of reclamation that one appreciates the importance of this scheme to Bombay. The history of the reclamations from the very earliest days of British rule I can put in a very brief form, if you will bear with me for a moment. At the outset Bombay was a conglomeration of seven islands separated from one another and from the mainland by creeks and wide stretches of swamp land. The low swamps were believed to be the chief cause of the terrible mortality among the early servants of the East India Company and, even in the 17th century, the Court of Directors urged upon their Council, then at Surat, the necessity of reclamation. The first large reclamation scheme was effected by the dam at Mahalahshmi now known as the Hornby vellard. Work on the first dam was stopped in 1727 apparently on financial grounds, but sufficient was then done to reclaim thousands of acres between Dharavi and Girgaum, which are now an important part of the modern "island" of Bombay. It is perhaps significant that the

dam was not made finally effective till some fifty years later under the Governorship of William Hornby. This work effected a remarkable change in public health and led to an increase in the population. The first causeway, from Sion to Mahim, was built at the beginning of the 18th century and Bombay was first connected to Salsette a century later, in 1803, when the Sion Causeway was constructed in the Governorship of Jonathan Duncan. It will interest the members of this Committee to know that till 1838 Colaba was still separated from the rest of Bombay at high tide. The last causeway, at Mahim, was not opened till 1845. At the time of the Civil War in America the overcrowding in Bombay was intense. In 1838 the population was estimated at 236,000; in 1872 the figure recorded was 644,400 and a census in 1864 registered, under abnormal conditions, a still larger figure. It was natural that relief from the congestion of the day should be sought by investing the wealth which then flowed into Bombay in fresh reclamations. Six million pounds sterling are said to have been utilised and by 1872 900 acres had been reclaimed. Those figures, translated into present-day values, would not show very much difference from the figures under discussion now either in acreage or money. What Bombay would be to-day without these 900 acres and the Hornby vellard reclamation it is difficult to imagine. I will conclude by saying this, if I may. The criticism comes from a section. The support comes from the masses of people. I and my Government have worked for them, because they need it very gravely. It depends what British standards are going to be set up in India. Bombay is the prime city of India—where one first lands, and where the conditions matter for our repute; and they are not fit to-day to bear the stamp of British workmanship or of British guardianship. You may take a narrow view and say that because this scheme may or may not have been properly handled in detail therefore this, that or the other may have to be done. All I care about to-day is that these schemes (to which I gave a great deal of my health and time in very difficult circumstances, and which needed a great deal of courage and hard work) should be pushed through to the end for which they were intended. I have said what I have said in order to give you a sense of proportion over the years. You see that the same schemes were embarked upon even 40 years ago. We are spending approximately the same amount of money and adding the same amount of land to Bombay with successs in each period. In each period there have been doubts and hesitations and possibly public clamour (perhaps for the same reasons as exist to-day), but each time Bombay has swept on and has become a bigger city. Unless you make it a cheap port it will never keep a great port. Our object was entirely hostile to the interests of those who criticise the scheme now. I have never hidden it from them, as my Indian colleagues here well know. I have always spoken quite frankly. The landlord interest, as such, so long as it was delaying the better improvement of the housing conditions of the people had to go. I never hid that from them. I said it openly in public over and over again. That is still our purpose—that nothing should stand in the way of better housing accommodation and cleaner conditions of living. I am not talking of a thing about which I do not feel extremely strongly, and I am not talking sentimentally. Nobody who has ever seen the Bombay slums will ever forget them, and those are conditions which I am not prepared to have any responsibility for after the instructions I was given; and whoever takes responsibility, if anybody does, for sweeping those slums away, at least I shall always be proud that, whether mistakes have been made or not, at any rate my name will be connected with the movement as having tried to do something in a much needed cause. I only hope this Committee will reflect very gravely before they interrupt the work which, I believe, if driven through with courage, energy and skill, will still be a success, socially and financially.

Sir Frederick Hopkinson.—Have not you already seen that we have made an interim report?

A.—I have, but I am rather a greedy person. I do not want half; I want all.

Sir Frederick Hopkinson.—Wait until the proper time.

Chairman.—The report is interim.

A.—I know, but this is perhaps the only occasion on which I shall have the honour of addressing this Committee, and therefore I do want to make my plea. I still believe not only in the material success of the scheme but in its great necessity from a social and moral point of view.

Chairman.—We are very much obliged to you, Lord Lloyd, for the evidence and the assistance which you have given us.

(The Witness withdrew.)

The Committee Assembled at 11 a.m. on the 16th October, 1926, all Members, except Sir F. Hopkinson, being present.

The examination of Mr. Lewis was continued.

Mr. Billimoria.—You have told us that you were engaged on this task from the 11th June, 1920, until the 12th July, 1924. You were in Bombay on the 11th June?

A.—No, it was not June.

Q.—You were engaged on the task from the 11th June, 1920, to the 12th July, 1924, were you not?

A.—I left Maymyo on the 20th June, and I arrived in Bombay somewhere about the 27th. I was in Bombay for a few days, and I think I left in the first week in July. I am perfectly certain that the 11th June, 1920, is a wrong date.

Chairman.—It is the 11th December, 1920. That appears in the history of the case.

A.—June was the month in which I arrived in Bombay from Burma.

Mr. Billimoria.—That is what I took from your evidence?

A.—It was not the 11th, because I did not leave Maymyo till the 20th.

Q.—You have told us, in the course of your evidence, that you had been preparing the project estimate in December, or early January, 1921?

A.—Yes, I had to begin it immediately.

Q.—You have also stated that it took you about 18 months to get that project estimate ready?

A.—Yes. Of course, I was not employed only on that.

Q.—I understand that, but with your own engineering skill and knowledge, coupled with the assistance which you received from your department, it took you about 18 months to prepare that project estimate?

A.—Yes.

Q.—For a scheme of this magnitude, a carefully prepared estimate was, of course, essentially necessary?

A.—Yes.

Q.—In any case, you would have devoted a sufficiently long time to consider all the aspects, and make sure of your figures? You could not have given any figure haphazardly. You wanted to be sure of the figures which you were submitting in your estimate?

A.—Yes.

Q.—Take it as a hypothetical proposition. Supposing you had been appointed by the Government of Bombay, or were asked to be responsible for the scheme, and were called upon to submit a report and estimate, you would have taken some months on the survey and borings, and would have gone into the matter very thoroughly before you had submitted your report, would you not?

A.—Yes.

Q.—If you had not done so, if you had submitted a report without a careful study of the whole situation, you would rightly have been accused of incompetence or ignorance?

A.—Well, that is a statement which you make.

Q.—You will agree with that?

A.—I might not have been ignorant, and I might not have been incompetent; I might merely have been careless and negligent.

Q.—You would have failed in the discharge of your duty if your figures had eventually turned out to be incorrect?

A.—No, I would not say that. You say, if I had not taken sufficient care to see that they were right in the beginning?

Q.—Yes.

A.—Well, as right as they could be. An estimate is only an estimate. It is not the final bill.

Q.—Of course, it may vary by a few per cent. here and there?

A.—I will not say that; various circumstances might occur.

Q.—If the figures had been based upon something, and they turned out to be incorrect in the end, you would rightly be accused either of incompetence, negligence or ignorance?

A.—You are usually supposed to be able to work within 5 or 10 per cent. of an estimate. I am not quite sure, but I think the rule in the Government of India is that if the excess does not exceed 5 per cent., no particular explanations are called for.

Q.—Five to 10 per cent. is usual in estimates for contingencies. That is always so?
A.—Yes; you usually allow 5 per cent. for contingencies.

Q.—You have told us that it took you about 18 months. If we take it from early 1921, it would be about the middle of 1922 that you got your estimates ready?
A.—Yes.

Q.—In fact, it was in May, 1922?
A.—I think it was in May. There was a tremendous amount of investigation and finding out about things when we started to work, and I could not say when we actually first put pen to those detailed estimates. We were told to go on, and we had to scheme out things, and leave the estimates. We had to make up our minds how we were going to proceed; and the making up of the estimate, instead of coming first, was left till afterwards by force of circumstances. It was not what I wanted. It was extremely inconvenient to us, because we were rather working in the dark.

Q.—What I want to get at is this—that at about May, 1922, this estimate was complete?
A.—Yes.

Q.—Then I am a little puzzled with regard to some of the dates. I find that Mr. Monie, the Secretary to Government, supplied the figures to the Indian Merchants' Chamber a long time before May, 1922, and that it was on those figures that his Excellency the Governor, in August, 1921, made a public speech before the Indian Merchants' Chamber.

A.—I will tell you how that occurred. Mr. Monie came to me and said, "His Excellency the Governor is going to make a speech, and he wants some figures." I said, "Good gracious, I have not got the figures." "Well," he said, "we must have something. We must have an approximate figure." We set to work on the spot to make out, entirely in a rough way, a very preliminary estimate. I do not know what the date was; any way, I had not my figures complete, and I made up this estimate. I have forgotten now what the figure was, and I do not know where the estimate is, but I handed it to Mr. Monie, and I said, "Now, you must understand that this is an estimate drawn up in a few hours." I was given a day, or at the outside a day-and-a-half or two days, to do the thing, and I said, "I must decline to be held responsible for the accuracy of this estimate. I am not sure of all these figures, but, as far as I can see, I think it will cost about so much."

Chairman.—It turned out to be a very accurate forecast of your eventual figure.
A.—It was, as far as I remember. When I finished the second estimate, I had the first one in a drawer of mine, and I took it out and, as far as I remember, the difference was about 30,000 rupees. But that estimate was only preliminary. I expressly said that I could not be held responsible for it, because I had not then got the data which I should require in order to make an estimate for which I could be held responsible.

Mr. Billimoria.—You know that Sir George Buchanan submitted his report in September, 1919?
A.—Yes.

Q.—And that no work actually started until a considerable length of time after that date? In fact you did not, as you say, come in until December, 1920, and no work had started then?
A.—No.

Q.—Can you tell us what were the circumstances which led to the estimate being revised to nearly double within a few months of it having been prepared?
A.—It was not so much a question of revision as of the provision of an estimate for the carrying out of the detailed work. The accounts of a work are kept according to the heads of the estimate. It would be utterly impossible, from an accounts points of view, to keep the accounts on *this*. (*Sir George Buchanan's original estimate.*)

Q.—That means you have to classify or subdivide the main heads?
A.—Yes.

Q.—I am not on that point. What I am on is this. Here the figure is 367 lakhs. In your estimate the figure comes to 702 lakhs. What were the circumstances intervening between that short interval of a few months which led to the figure being doubled? Never mind the details. For instance, take the first item, concrete. You may have several details which may bring you up to that figure, or to a little less or to a little more. I am not concerned with that. I am concerned with this: taking it as a whole, in September 1919 the figure was 367 lakhs. When you started preparing your estimate the figure came to 702 lakhs. Was there any abnormal circumstance intervening in that period which could have doubled that figure?
A.—No. When I came to look into it I found that things were required which increased that figure, when I worked it out.

Q.—Normally were the circumstances very materially different between September, 1919, and December, 1920, in the way of prices or otherwise?

A.—I could not tell you.

Q.—Then can you explain how the figure——

A.—That was done in 1919, was it not?

Q.—Yes.

A.—I did not know anything about Bombay in 1919.

Chairman.—But that is not your figure. The 367 lakhs is not your figure?

A.—No. My figure of 702 lakhs was obtained by going as carefully as I possibly could into every detail, as I foresaw it, and providing for what was required, as I could see it at that time.

Mr. Billimoria.—I will put my question in a different form. When you prepared that estimate, were the prices ruling at the time the same as in 1919, or had you any knowledge or information that they advanced by cent. per cent.?

A.—I really do not know now. I had come from the war. I cannot tell you exactly as to prices. I was here the other day and heard Colonel Paddon's evidence with regard to the difference in prices, and I can give you no evidence which can better that, or even confirm it—except from general knowledge that prices were extraordinarily high.

Chairman.—We are getting rather away from Mr. Billimoria's point. He wants to know how it came about that an estimate of 367 lakhs in September, 1919, became, in the course of 15 or 18 months, 702 lakhs. That is the question—just the reason why?

A.—I think the main reason is that it was gone into in greater detail.

Mr. Billimoria.—Therefore if, in the original estimate, greater care had been exercised and all the details had been gone into, that estimate would not have resulted in a figure of 367 lakhs?

A.—I do not think so. As far as my experience goes, it could not have been done. When I did go into the matter as thoroughly as I could, I found the figure came to 702 lakhs.

Q.—So the figure of 367 lakhs was an impossible one?

A.—The work could not have been done for the price.

Q.—Have you before you Sir George Buchanan's report and the project estimate? Will you kindly turn to page 29. Items 1 to 6 in Sir George Buchanan's estimate amount in the aggregate to 118.11 lakhs—sea wall?

A.—Yes.

Q.—Now will you kindly turn to the project estimate prepared by yourself on page 7, items 1 to 9, and total this up. I will give you the figure, which is absolutely accurate. It comes to 2 crores 35 lakhs, 21,275.

A.—Yes.

Q.—The headings, as far as the sea wall is concerned (barring those greater details in your figures or estimate, perhaps) are just the same. Can you explain why a crore and a quarter more were provided for in respect of the sea wall in your project estimate within 15 or 18 months of the original estimate? You have all the details there in the supplementary statement?

A.—The details?

Q.—If those details are correct, the figure of 118 lakhs cannot possibly be correct?

A.—No. It is entirely inadequate.

Q.—Then if you will kindly look at items 7 to 11, reclamation, in Sir George Buchanan's estimate at page 29 they total up to 1 crore 66 lakhs 52,000. Your figures for items 10 to 13 amount to 2 crores 51 lakhs 33,946—a material difference, nearly 90 lakhs over and above?

A.—Yes.

Q.—Your items 10, 11, 12 and 13, corresponding to items 7, 8, 9, 10 and 11 in Sir George Buchanan's estimate?

A.—Yes.

Q.—Then item No. 12 in Sir George Buchanan's estimate is 75 lakhs, and your items 14 to 16, under the same heads, come to 2 crores 11 lakhs 90,000—a crore and a quarter additional.

A.—Yes.

Q.—Was the estimate of 75 lakhs an adequate provision?

A.—No, obviously inadequate.

Q.—That indicates that the main item of storm-water drains was not taken into account at all. You have provided for it in your estimate at 64 lakhs 28,100. It was not thought of in the original estimate?

A.—In the original estimate apparently Sir George Buchanan has taken that from somewhere else *en bloc*.

Q.—I am taking these figures as they are, and they account for the material difference. If there is a rise of 120 lakhs, that one item of 64 lakhs accounts for a material difference. Then item 13 in Sir George Buchanan's estimate, with regard to establishment, is 17 lakhs 98 thousand?

A.—Yes.

Q.—You work it out under headings 17 and 18 to 66 lakhs 67 thousand?

A.—Yes.

Q.—That is half a crore more for establishment?

A.—Yes. The figure is taken at 7½ per cent. Sir George Buchanan took 5 per cent.

Q.—Even if you had taken 5 per cent. on the lower figures they would have been very much higher, so that the figure is hopelessly inadequate?

A.—As a consequence.

Q.—No provision has been made, on Page 59 of Sir George Buchanan's estimate, with regard to unforeseen charges or contingencies. You put yourself very wisely on the safe side by including a 10 lakhs figure for contingencies?

A.—Yes.

Q.—Your item No. 19 which brings up your total to 7 crores and 75 lakhs, compares with Sir George Buchanan's figure of three crores 77 lakhs?

A.—Yes.

Q. Therefore these figures distinctly and clearly prove that the figure of 377 lakhs was very inadequate?

A.—Yes.

Q.—In the course of your evidence you mentioned that the commencement of the sea wall from both ends was done under certain orders. Will you please explain whose orders?

A.—The orders I think were issued by the Government to Sir George Buchanan. That was brought out yesterday, was it not?

Q.—You carried it out under orders. I want to know under whose orders you carried it out?

A.—Well, it was the scheme. When I arrived on the scene the scheme had been settled on. It was that the work was to be carried out at both ends. It was on that that I started and carried out the work.

Q.—When you refer to " orders " were you told by anybody particularly?

A.—It is a long time ago. It was a sort of talking it over. One would say " How is this going to be done " and the reply was that you were going to begin at both ends.

Q.—You do not remember exactly as to who gave you the orders?

A.—It is obvious. Obviously it must have been Sir George Buchanan in talking it over, and he had instructions from the Government of Bombay.

Q.—May I just tell you that it has been suggested in Bombay that the starting of the sea wall at Marine Lines was for merely propaganda purposes—for advertising the scheme?

A.—I do not know anything about that.

Q.—Would not that be so—because financially it was a very unwise proposition?

A.—You are better able to judge of that than I am.

Q.—You are not aware of any propaganda?

A.—No. It was a question not of propaganda but of getting the work done.

Q.—You have told us that you began to feel doubts as to the material in the harbour in 1921?

A.—Yes.

Q.—Soon after you arrived?

A.—Yes. I think that is so.

Q.—Did you report the matter to Government? Did you bring it to their notice directly or through any official concerned in a Government Department, either in writing or in any conversation or interviews or conferences? You cannot remember?

A.—I cannot remember. Those sort of things grew; they came slowly. It is very difficult to specify.

Q. It is very important for our purpose. If you felt doubts that the material was not going to be suitable as far back as 1921, it is not surprising at all that the scheme should have failed, is it?

A.—I will not say I had doubts or misgivings about it, but I must say that I was not absolutely sure in my own mind.

Q.—You are not certain of your having mentioned it to anybody thereafter?

A.—I cannot say.

Q.—Can you fix any date—the earliest, or the latest—at which you brought it officially to the notice of Government? Cannot you remember?

A.—No, I cannot remember. I should have to go through whatever there is here and search it out.

Q.—I will go to another question. To what do you attribute this failure—the dredger or the material? Is it because the dredger has not been proving its capacity, or is it because the material is not what it ought to have been? The material could not have changed?

A.—No. Of course you must remember that I have not been there for two and a half years. We got a very great deal of very good material at the beginning in the first year. I do not say that the quantities were what we expected, but the material was very good.

Q.—The material for the purposes of reclamation was good?

A.—In the beginning.

Q.—Subsequently it was very disappointing?

A.—I do not know anything about that.

Q.—The figures prove that. During your period of office as chief engineer the output was not satisfactory?

A.—No, the output was not satisfactory.

Q.—It has been said that it is the fault of the material, like a bad carpenter quarrelling with his tools. That having been said, should not the investigation have taken place before the dredger was ordered? Should not the suitability of the material have been enquired into? It is not the ink which is going to hold the ink-pot. It is the ink-pot which is going to hold the ink?

A.—I think Sir George Buchanan accepted the result of Mr. Kidd's investigations.

Q.—Without enquiry as to the suitability of the material for which the dredger was built?

A.—I think he accepted Mr. Kidd's statement on that point too.

Q.—Mr. Kidd's statement does not indicate soft material. If you will refresh your memory you will find that he says " stiff and unctuous clay "?

A.—Does he not say " eminently suitable " somewhere or other?

Q.—Suitable in the sense that the clay was stiff and unctuous?

A.—I had an idea in my mind that the material was judged to be eminently suitable.

Q.—You can take it from me that Mr. Kidd has described the clay as stiff and unctuous. He has not described it anywhere as soft.

A.—I am under the impression that it was said by Mr. Kidd that it was suitable. Yes, here you are. Mr. Kidd says " It has been completely established that there is available more than three times the quantity required of suitable material."

Q.—That does not indicate soft clay. He does not use the phrase " soft clay " at all. There is no doubt that there is material in the harbour, but the point is whether the dredger which was built was suitable for that material or for something else?

A.—Here Sir George Buchanan says: " On the assumption that Mr. Kidd's survey and borings are correct—and I see no reason to doubt their accurancy as a great many borings were taken—I accept his conclusion both in respect of quality and quantity of material."

Q.—The quality which Sir George Buchanan discusses in the latter part of his report is hard clay. Nowhere in no one of these pages does he ever refer to the words " soft clay." In a few minutes I will come to some of the correspondence which passed between you and him where he refers to this material as hard clay. Did Sir George Buchanan at any time complain either verbally or in writing about the inefficiency of men or extravagance of Government while you were in office? You cannot tell us for the period subsequent to that, but during your period of office did he ever complain to you verbally or in writing about the inefficiency of men or extravagance of Government, or of your Department?

A.—In the reports which Sir George Buchanan wrote on his inspections, there are in some cases points which he raised. He said on one occasion, as I mentioned the other day, that we had exceeded the quantity of stone required to be placed in the first section of the Marine Lines wall by 50 per cent.

Q.—That would happen in the ordinary course of engineering work?

A.—No, it was a mistake. It was not 50 per cent. There was a small excess, but not 50 per cent.

Q.—There was a small excess; that is evident and natural. That is an every-day occurrence?

A.—You have asked me whether he complained about things.

Q.—About extravagance. Would you call that extravagance?

A.—In ordinary circumstances to use 50 per cent. more material than necessary would have been extravagance.

Q.—Was it a fact that you used 50 per cent. more material than was necessary?

A.—No, we did not.

Q.—So that it was not extravagance?

A.—No. I think the use of the small amount of extra material which we did use was justified by the circumstances which ruled at the time.

Q.—Would you call your Department inefficient for that reason?

A.—No. I do not think anybody has ever told us we were inefficient.

Q.—I will now ask you kindly to direct your attention to the item of storm water drains. It is perfectly plain from your letter of the 10th December, 1923, at page 104. Have you got that?

A.—Yes, 5491.

Q.—The last paragraph but three says " As these are exceedingly important items of the work, the omission detracts from the value of the proposal." You are talking of the storm water drains there. I will read the whole paragraph: " I notice that Messrs. Meik & Buchanan in their letter make no mention of storm water drains. As these are an exceedingly important item of work, the omission detracts from the value of the proposal." This may remind you of the fact that storm water drains were not thought of when the original estimate was prepared?

A.—Well, I am not quite sure what this was about.

Q.—It is clearly about the storm water drains, if you read the whole of that paragraph?

A.—Yes, that particular paragraph, but I think it was a question of the programme.

Q.—If you are in any doubt about it will you kindly turn to Page 66. If you look at Paragraph 2 you will see it says: " It is understood that you have fears as to the suitability of the material in the harbour." Then he says, " I remarked that in my judgment the first thing to do was to ascertain the precise nature of the material in the harbour by a practical test, and we discussed the various methods short of beginning the reclamation, viz., by grab dredger," and so on, and if you turn to Page 67, under the heading of " storm water drains," in the memorandum, Paragraph 2, you will find: " The original idea in respect to storm water drains was to continue the existing drains from their present outlets to and through the new sea wall, and in your project estimate you showed five outlets," etc. That is a clear indication that those storm water drains were never thought of by Sir George Buchanan. This is a memorandum signed by Sir George Buchanan, dated 10th January, 1923. His estimate was in September, 1919. Is not that clear from this?

A.—It seems he had some idea as to storm water drains.

Q.—Not of the design or the construction, or what ought to be suitable for this reclamation—or, at any rate, not such as would cost 64 lakhs for storm water drains alone?

A.—The number of drains that come into Back Bay from the town is very great. We have had to connect them up in many cases. What was your original question?

Q.—That the storm water drains were omitted from the original estimate, and these letters give that indication?

A.—Unless the storm water drains are included in that figure of 75 lakhs.

Q.—If you want to qualify that, I will ask you whether 75 lakhs would be sufficient to cover roads, lighting, sewage drains and storm water drains?

A.—No, it would be inadequate.

Q.—Therefore they were not included. That would be the natural conclusion?

A.—Yes.

Q.—Will you kindly refer to page 12 of this document of correspondence, where you will find a letter from Sir George Buchanan dated 22nd June, 1921, in which he says, in the second paragraph on that page, " We hope there will be a great deal of hard clay that will require very little moorum topping."

A.—Yes.

Q.—So he never thought of soft clay. This was 1921, two years after he sent in his report. He did not think of soft clay at all?

A.—He said he hoped there would be a great deal of hard clay. That does not preclude exactly the presence of soft clay, does it?

Q.—I see. I want to make a point out of this Supposing anybody had discussed with him that the dredger was built on the assumption that there was going to be soft clay, would it not have influenced him in any part of the correspondence, apart from his report, so that he would have stated somewhere that there was the existence of soft

clay and not hard clay? I have not come across a single letter of Sir George Buchanan, or any paper, in which he indicates soft clay?

A.—No.

Q.—If he therefore knew that he was basing his estimate on soft clay, and ordering dredgers to pump out soft clay, he would not have called that material hard clay, even at that distant date in 1921, would he?

A.—No.

Q.—Then will you turn to page 14: the first line: "We were not only the engineers for the machinery, but for the execution of the entire work."

A.—Yes.

Q.—Thereby indicating that they were not consulting engineers, but that they were the responsible engineers for the work?

A.—That has been Sir George Buchanan's position.

Q.—That attitude is taken throughout 1921?

A.—Yes.

Q.—Now will you turn to page 66. You will remember you told us that you felt doubt about the suitability of the material in 1921? Sir George Buchanan confirms that, in paragraph 2 on page 66, in December, 1922. So that you must have had some conversation with him with regard to the unsuitability of the material, and Sir George Buchanan knew it?

A.—Yes—well, as regards the suitability of the material.

Q.—In that paragraph he says that the first thing that should be done was to ascertain the precise nature of the material. Do you put the cart before the horse, or the horse before the cart? Which is the proper time to investigate the matter—after you have found you are in the mud or before you take a jump into it?

A.—Usually before.

Q.—Then on page 103 there is your letter dated 21st November, 1923, in which you say, "the whole show has busted."

A.—No, I do not say that.

Q.—There it is.

A.—No, no.

Mr. Billimoria.—That is what I find in the printed document.

Chairman.—Read it.

Mr. Billimoria.—"What inference is the man in the street going to draw—that the whole show has busted."

A.—I did not say that the whole thing had busted.

Q.—Will you kindly read the whole paragraph: "I would point out that we are by no means sure that the filling from the harbour is going to be of use as a means of reclaiming the area." That is your letter is it not?

A.—Yes.

Q.—"If it proves unsuitable the fact will become common property about the time the work on Marine Lines will stop. What inference is the man in the street going to draw?—that the whole show has busted." Can you explain that? What had you in your mind before you wrote that letter?

A.—I am afraid I was very upset at that time by having the whole of our year's programme cut down by half. We had made full provision for the work for the whole year, and we were suddenly told to stop it, and I was trying to get that decision reversed from the construction point of view. It seemed to me that by deferring the extra 1,500 feet of gantry for one year we were not going really to save much.

Q.—Did that lead you to make that observation?

A.—This was a note written with the object of securing the withdrawal of the orders to do only half the season's work.

Q.—It is a very interesting observation, is it not?

A.—Yes. Perhaps I ought not to have put it in that way.

Chairman.—But why not? It exactly expresses your view?

A.—Yes.

Q.—What is the objection to it?

A.—It is perhaps a little bit colloquial.

Chairman.—But it hits the mark, does it not?

Mr. Billimoria.—Will you kindly turn to page 115. I want to ask you something about your recommendation for the purchase of the "Jinga."

A.—That was only a suggestion.

Q.—Do you know that she has never been used up to now?

A.—I do not know anything at all about it.

Q.—She has been lying in the dry docks for over 18 months and has not been used. Expenses are running on every day, and the possibility of her ever being used seems very remote.

A.—I was studying the question of how the work was to be done with Mr. Brims, who was the officer in charge of the dredging, and we worked out many schemes. The lengths were very great, and we came to the conclusion that some more power would have to be obtained to get the material to where we wanted it. This letter was accompanied by two or three plans which showed the position exactly, and which really would make this understood very much easier. That was merely a suggestion. It seemed to us to be necessary to have another boosting station, and that was a suggestion as to how it could perhaps be done.

Q.—Did you think she was a suitable boat to be purchased at that cost?

A.—What we suggested was that the engines should be used.

Q.—Did you work out what it was going to cost in the end?

A.—No. It was only a preliminary suggestion. I say here " it is suggested."

Q.—You are an engineer of repute, and you must know that when a ship is lying in dry dock it is an expensive process.

A.—But has she been lying in dry dock?

Q.—Yes, for eighteen months. Have you heard of such a thing before in your experience as an engineer of a vessel being in dry dock for eighteen months?

A.—The " Kalu " was in dry dock for a certain length of time, but it was nothing like that.

Q.—Will it not surprise you now to find that she has been lying there, with all the expenses running up day by day irrespective of the interest on the original cost?

A.—Yes. I did not know that.

Q.—If you will refer to Page 124, your letter No. 2203, dated 6th June, 1924, you will find that in Paragraph 4 you say " Sir George Buchanan will be able to see for himself that the mistakes have taken place and that the complaints made in my letter were justified "?

A.—Yes.

Q.—Sir George Buchanan had knowledge himself of the mistakes that had been committed?

A.—Oh no. That refers to a particular matter.

Q.—If you turn to Page 112 you will find what that matter is.

A.—Some plates were sent out wrong for the pipe line. I think they were for floaters. There were certain patterns of plates. All these floaters were the same. Instead of an equal number of plates of each description being sent out, some were in excess and some were in defect. That letter was written in answer to a letter from Sir George Buchanan in which he forwarded the indignant repudiation of Messrs. Simons & Co. and the inspectors to my remarks that the things had not been properly inspected. The things would not fit. We had, say, 25 of one to 30 of the other. The figures are all in the correspondence.

Q.—So your remarks were absolutely justified?

A.—Yes, but that is a particular case.

Q.—Even taking that particular case, your remark that Sir George Buchanan himself knew of the mistakes was justified?

A.—No, no. You are trying to generalise that, are you not?

Q.—No. I am speaking so far as the complaints made in your letter are concerned.

A.—But that was a particular case.

Q.—I am reading this paragraph of your letter—that your remarks were justified?

A.—As far as I know, my remarks were absolutely justified. What was the final result, Mr. Elgee, do you know?

Chairman.—I think Messrs. Simons stood to their position and said " This complaint has no foundation because we have taken the greatest care to mark everything, and there is a misunderstanding at your end."

A.—What happened was that these floaters and pipes came out in plates and were put together in Bombay. They were put together by the dock people, and when particular plates came in we found they did not fit, and we had to make alterations which cost us something like 5,000 rupees.

Mr. Billimoria.—Therefore the statement you made in your letter to Messrs. Meik & Buchanan was justified?

A.—Oh yes; in my opinion it was quite justified.

Q.—So far as you know, there has been no other explanation offered; your remarks have proved to be correct?

Chairman.—I think you must be cautious about that, because I believe there is another letter in which Messrs. Simons stick to the point and say " This will not do; it is a mistake at the other end."

A.—Everybody said that.

Mr. Billimoria.—Did you find that there was a mistake in India? Did you make mistakes?

A.—No. We had to rectify the mistake which was made in England. It was a question of inaccurate work and inadequate inspection, as it seemed to me.

Chairman.—What page are you on?

Mr. Billimoria.—Page 124. It is letter 2203 of the 6th June.

Chairman.—That is Anderson's letter; that is right.

Mr. Billimoria.—As far as you are concerned, we will take it now, Mr. Lewis, that your observations were absolutely justified, inasmuch as Sir George Buchanan knew for himself that mistakes had been committed?

A.—Sir George Buchanan had not looked at the thing at that date when we found this out, and in my letter—I do not know where it is now—I complained of those mistakes.

Q.—I think your letter is at Page 112?

A.—Yes. " There has been trouble in the re-erection of the 20 to 50 feet length floaters for the new 42 inch pipe line for the " Kalu." The pipes have, as shown on the re-erection drawing received by you from Messrs. W. Simons & Co. Ltd. on the 13th December, 1923, been marked with re-erection numbers. For the set of 20 floaters 33 have been received marked (144) (145). These are all constructed to the details of this particular section. Of end section (143) 21 were received giving a surplus of 1 section. But of section (144) (143) only 15 were received, being 5 short; of (140) (141) 17 were received, being 3 short; of (141) (142) 15 were received, being 5 short." So, you see the various kinds of plates were indicated by the numbers, and instead of there being 20 of each of these plates they sent us out an excess of some of them and an insufficiency of others.

Q.—Then you proceed to say " As this is due apparently to carelessness in the manufacture and lack of inspection, I presume the supplier and inspector will be prepared to make good the extra cost "?

A.—Yes. That was the ordinary suggestion to make.

Q.—So that after having gone through your letter again you now confirm the view which you held at that time—that those remarks were justified?

A.—Yes.

Mr. Billimoria.—We will now turn to Page 128.

Chairman.—You had better refer to Page 123, at the bottom, where Mr. Anderson says " I do not, of course, doubt the good faith of the writer of the letter, but can only conclude that he has been misled."

A.—I had not been misled.

Chairman.—One was saying so and so, and the other was saying something else, and that is how the matter rested. Mr. Lewis supports his case by saying he had to get the things altered in Bombay.

Mr. Billimoria.—What is the position? Who is at fault? Where you at fault, or the makers?

A.—The makers and the inspectors.

Q.—On page 128, in your letter to Messrs. Meik & Buchanan dated 14th July, 1924, you say this at the end, " As these figures diverge considerably from the five annas per cubic yard at which you estimated the work would be done I send them for your information as soon as obtained." So that you supplied the figures showing that it was impossible to work at five annas a cubic yard?

A.—Well, that we had not succeeded in that season's work.

Q.—At page 129, in a letter addressed to you by Messrs. Meik & Buchanan, they express very great surprise: " We cannot say that we are surprised at the figures of quantity, as calculations made some time ago in this office showed that at the present rate of progress the reclamation would be completed in 35 years." In view of what has happened, is there any doubt left in your mind, or is there any surprise, that the reclamation could not be completed within the stipulated period, from the events which have transpired? It was anticipated that the whole thing would be completed by 1926. We are now at the end of 1926.

A.—I think very shortly after we had gone into matters we extended that date.

Q.—" The essential feature of the reclamation being the capacity of the dredger to reclaim at the rate of 2,000 cubic yards per hour, Government naturally view with great

dissatisfaction the slow progress, which threatens most seriously to prejudice the financial prospects of the scheme that was undertaken on the recommendation of Sir George Buchanan."

A.—We are now getting to beyond my time.

Q.—But the facts are there—that the scheme was undertaken on the recommendation of Sir George Buchanan?

A.—Yes.

Mr. Billimoria.—On the basis that the dredgers were to pump out 2,000 cubic yards per hour for 15 hours a day. That having failed, the project and the slow progress are viewed by Government with great dissatisfaction.

Chairman.—Where is that? What you have given us is a very correct summary, but I do not see your actual phrases.

Mr. Billimoria.—I do not know whether I have prepared this summary myself or whether it appears on the document. I will find out and give you the exact page. The scheme, having been based on Sir George Buchanan's estimate, which in turn was based on the assumption that the dredger was going to pump 2,000 cubic yards per hour for 15 hours a day, and that having failed, is it not natural that the Government should view with dissatisfaction the slow progress of the work? It is on page 160, in a letter of the 28th August, 1925. I will read the passage. " I am desired to emphasise the very unsatisfactory nature of these figures, and to state that Government view with great dissatisfaction the slow progress of the work, which threatens most seriously to prejudice the financial prospects of the scheme. Government undertook the reclamation on the recommendation of Sir George Buchanan contained in his report of September, 1919." It goes on to say, " If dredging alone is carried out, at the rate obtained last season, it is now estimated that the work cannot be completed until the year 1943, and that the cost, excluding interest charges, will amount to Rs. 11 crores," and so on. Will not you, as an engineer of repute and vast experience, having served Government for over 25 years, agree with the view that the Government now hold, namely, that this slow progress threatens most seriously the financial prospects of the scheme?

A.—It is obvious that the dredging, not having come up to anticipation, does spoil the scheme.

Q.—Can you, from your experience, engineering or otherwise, suggest any means by which this tremendously heavy loss can be reduced?

A.—I have not thought about it. I have retired.

Chairman.—There is one matter about which you might be able to help us, and it is this. It might be prudent to get rid of the dredger at the end of say, next year, and to see what price can be obtained for her. It might be prudent to have the locality all round Bombay inspected with very great care and ascertain whether there is sufficient dry filling, and to finish this job as a dry-filling proposition. You would not want very much plant for the dry filling, would you—only a certain increase in the rolling stock, and some help from the railways as regards transport?

A.—Is the B.B.C.I. now electrified?

Sir M. Visvesvaraya.—Yes.

A.—That would probably help matters.

Chairman.—Can you help us at all by telling us where you think there is dry filling?

A.—I cannot give you any information of any value. I did not go into the question myself.

Sir M. Visvesvaraya.—I find I am wrong. It is the G.I.P. Railway which is now electrified.

Chairman.—At all events, it means the possibility of being able to make some arrangements with the railway by which you can get an increased number of trains?

A.—Yes.

Q.—What I am particularly anxious to get your help upon is that one point. Do you know of any place in the neighbourhood of Bombay where there would be likely to be an amount of moorum to fill up the remaining blocks?

A.—I think if I were in Bombay, and had to go into the matter and investigate it, I should go to Trombay first.

Q.—We have had evidence about Trombay. A very limited quantity was given us as being available at Trombay.

A.—I never investigated that question; but, as I say, if I had to investigate it, that would be one place to which I would go.

Sir M. Visvesvaraya.—From Dadar the two railway lines diverge?

A.—Yes.

Q.—Are there any places within five or six miles of Dadar where you could get moorum from? Mr. Kidd said it was possible to get enough moorum from within 10 miles of the reclamation site?

A.—I do not know.

Q.—You are not particular what kind of moorum you get for filling?

A.—No, not for the filling.

Q.—You could get abundant material in the open country on the G.I.P., and also on the B.B.C.I. Railway. If you do not get hills of moorum you could dig into the ground?

A.—Yes.

Q.—There are places full of earth to be had either from the hills or from the ground?

A.—There is a great deal of trap rock underneath.

Q.—But you only have to avoid the places where the trap rock is?

A.—It would mean working in pockets.

Q.—It means avoiding the trap rock and digging where you can get moorum?

A.—That might or might not be feasible, as the trial pits would show. Before you started on an object like that you would have definitely to have a very large quantity of the material at hand.

Q.—Five miles from Dadar you have got nothing else but earth, moorum or rock?

A.—That means you would get it from the island of Bombay.

Q.—Beyond the island?

A.—In Salsette?

Q.—In Salsette on the other side, near the big reservoir.

A.—There was a lot of stuff got from there.

Q.—There are hills of rock or moorum there?

A.—I really could not give you any information which would be of any value.

Q.—There is nothing but moorum or rock.

A.—If there is nothing but moorum there, and it is of sufficiently good quality, it might be possible to obtain material for filling.

Q.—What else could there be in open country?

A.—I do not know. When you dig you often find what you do not expect to find.

Q.—All that would be available for the reclamation?

A.—I did not get much general experience at Bombay, but we found at Kandivli that the bed-rock was not far from the surface.

Q.—That is slightly different.

A.—You must remember that all that moorum is broken-down rock, and you never know when you are going to come on to a great stretch of rock that has not disintegrated.

Q.—You can take trial pits?

A.—But even trial pits, on a reasonable scale, would hardly allow for that.

Q.—Is it not quite an easy thing to dig pits?

A.—Yes, but how close are you going to dig? If you are going to do it at 200 feet apart, you have plenty of room for nice big rocks underneath in between them. When I went to Bombay in 1920 for the first time, as I said, one of the P.W.D. engineers had investigated the question of rock supply and quarries, and he mentioned two hills—Andihri was one, and Gilbert Hill, or some name like that, was the other. He remarked that a great deal of moorum and a great deal of rock would be required, and that both those were found in these hills. It was just that admixture that made me shy off those hills, because what we wanted was clean rock unmixed with moorum. We would not want to come across the large rocks when we required moorum.

Q.—You would have no objection to earth?

A.—Not if earth could be found in quantities which could be easily handled by machinery.

Q.—There is nothing in that area but moorum or rock or earth, and you would only have to find out what the depth of rock is?

A.—It would mean investigation.

Q.—I want to put to you one or two questions about the organisation and management of the works, which we discussed three days ago. Yesterday the question came up again. You said you had to serve two masters—the Development Director and the Engineer?

A.—That was obvious.

Q.—You have had wide experience of public works in India. In your experience, do you know of any instance in which the engineers, or the consulting engineers, remained in England and the work was carried on in India?

A.—No. All work done by the P.W.D. is done by the officers on the spot. The only case at all analogous to that was Delhi, where the architects were in London.

Q.—They were not engineers?

A.—No, but they were the architects, and their position would be the same as the engineers.

Q.—They prepared the designs and inspected the works once a year?

A.—But they had their office on the spot.

Q.—And their representative on the spot?

A.—Yes.

Q.—Here they have no representative?

A.—No.

Q.—Unless he regarded you as his representative. You were not paid by him?

A.—No, I was paid by the Government of Bombay.

Q.—So you know of no exactly similar case?

A.—No.

Q.—I know the Delhi works, and I was on a committee dealing with those works for some time.

A.—I was there as superintending engineer.

Q.—The engineer went there and stopped for a few weeks. He sent in his plans and he approved of all the detailed plans, did he not?

A.—All the detailed plans, or nearly all, were drawn in London.

Q.—And sent out?

A.—Yes.

Q.—But that was not done in your case?

A.—No, we had very few drawings from London.

Q.—Do you know of any cases, whether in India or in England, where estimates for works are sanctioned by the authorities concerned without the approval of the engineers?

A.—That occurred during my absence on leave. It was what the Government did. If I had been there I should have asked that the matter should have been referred to Meik & Buchanan.

Q.—That shows the amount of work they did for you. If they did not insist on examining the estimates—and they were responsible engineers, as they themselves stated —they could not have been in close touch with the works, could they?

A.—I think a copy of the estimate was sent to them very soon, because I remember discussing some points with Mr. Meik when I went to see him while I was on leave in 1922.

Q.—They were the engineers and they had to do some work?

A.—They were informed. They received copies of it. How soon I do not know.

Q.—But the engineers who were responsible would not allow an estimate of 702 lakhs to go through without their knowledge or consent. You will agree to that. You were a Public Works Officer for many years. Do you know of any work in any part of the world where you engage engineers and staff for a few years and entrust them with the power to make purchases amounting to a million pounds or more without scrutiny and without check by any permanent official? Was there any provision for check?

A.—Do you mean purchases?

Q.—I am saying nothing against you; I am merely concerned with the system.

A.—Ordinarily, as you know, when machinery is required you state your requirements on an indent. That indent was sent to the India Office. It is now sent to the High Commissioner. The Department of Stores then invites tenders, procures the machinery and inspects it. In this case Messrs. Meik & Buchanan were appointed the engineers for the work, and it was suggested, and agreed, that as they were going to carry out the work it would be as well if, as far as the inspection and selection were concerned, they were to do the work which ordinarily would be done in the High Commissioner's office. They knew what they wanted. They asked for tenders. They received those tenders, and they forwarded them on to the High Commissioner or Director-General of Stores and said: "We recommend that such and such a tender be accepted."

Q.—Do you know of any case in which their recommendation was disallowed?

A.—I do not know.

Q.—So it comes to this, that the engineers were purchasing and that the Director-General of Stores was only a medium?

A.—It was a special case.

Q.—It was an accident that you were a permanent official previously, but the firm of engineers and their nominees on the spot, who formed a temporary staff, were entrusted with all this responsibility?

A.—I think they were quite rightly entrusted with the responsibility.

Q.—What hold had Government on them if things went wrong or if money was lost?

A.—They did not have to touch any money.

Q.—It is not a question of touching. I am not accusing you or anybody; I am talking about the system.

A.—I think the arrangement was a perfectly good business one. I think that if you entrust a firm of engineers to carry out a work, you can certainly trust them with buying the tools which are necessary for the carrying out of that work.

Q.—Is it not the practice for the engineers to invite tenders and then submit them to Government or the principal on the spot for scrutiny before a selection is made?

A.—Instead of having a professional adviser of Government, who was not particularly interested in this particular case we had the people who were most interested in the case. I think it was a very reasonable arrangement.

Q.—But somebody should approve of their proposals on behalf of Government, should they not?

A.—They did not order the stuff. They merely recommended that such and such a firm's offer should be accepted. The whole of the tenders and complete information were forwarded, and if the Director-General of Stores had seen that anything was greatly amiss, he had every right to raise the question, and would undoubtedly have done it. He had the control because he had the ordering of the stuff.

Q.—It was a Post Office affair?

A.—You are assuming that people are not doing their job.

Q.—I am not assuming anything.

A.—But that is what it comes to if you say it was merely a Post Office job, and that the Director-General of Stores was merely a machine for forwarding letters.

Q.—There was nothing left for him to do?

A.—Yes, there was. He could have objected and said: "Our experience is that that firm is not as good a firm as it might be," and he would probably have drawn Messrs. Meik & Buchanan's attention to it. That is one case.

Q.—If you were chief engineer or secretary to Government in Bombay, the final tenders would come to you for approval?

A.—No. You would ask the Secretary of State to purchase you such and such machinery, and he would purchase it and send it out, and give you information as to when it had been sent out.

Q.—But you send out the specifications and sometimes the tenders come to you?

A.—I have never seen tenders sent from the India Office out to India for selection by the officers out there. I never heard of a case of that sort.

Q.—Do you not ask for tenders through the Secretary of State?

A.—No. We ask the Secretary of State to send us out such and such articles, and he does it. The whole of the machinery for that is here in London, and we have nothing to do with it. We use what we get.

Q.—That is in ordinary cases?

A.—Yes, in ordinary cases. That is the usual rule, and there is no difference in this case, except the matter of size.

Q.—In this case you have got the engineers and the engineers are men employed for five or six years, and the selection of the tenders are left to them. It was especially left to them in this case?

A.—The power of recommendation was left to them, but it was always subject to the concurrence of the Director-General of Stores. The Director-General of Stores was the officer who bought the things. You will notice that the details of the information we got—the monthly statement of the progress of stores—were always headed "Contract so and so." That was the contract entered into by the Director-General of Stores on behalf of the Government of Bombay.

Q.—In this case the Government did not exact from the engineers the duties expected of them?

A.—When the engineers were told that their recommendation had been accepted, they then appointed inspectors to follow the manufacture of that material from beginning to end and to make the necessary tests. They worked in the same way as the Stores Department would have done.

Q.—The head of the Government, or his technical adviser usually scrutinises indents, does he not?

A.—I think as a matter of fact indents go up direct from the superintending engineer's office.

Q.—But there is a superintending engineer—a permanent official—to send up indents?

A.—Yes, but it does not matter whether a man is a permanent official or not.

Q.—But here you are dealing with millions of money and with a temporary staff. I am not insinuating anything; in fact I go further and say that I have no doubt at all as regards the honesty of the highest officers is concerned?

A.—It is a question of Meik and Buchanan—whether it was a good arrangement; whether the arrangement of letting Meik & Buchanan call for tenders for the machinery that was required, and inspecting it, after their selection having been approved by the High Commissioner, was a proper procedure or not? To my mind it was an eminently proper procedure. It saved probably a good deal of time.

Q.—But it would have been a very good procedure if the indents, and also the final tenders in important cases, had been examined by the Development Director and passed?

A.—The indents originated from me. I wrote to Meik & Buchanan saying: "We want such and such articles." I was the chief engineer. I was the originator of the demand. Meik & Buchanan criticised that demand.

Q.—You say you were the originator, but they might also be the originators?

A.—No. I do not think they ever originated demands themselves. I think the demands always originated from me or from my office. They criticised those demands, and then when they had satisfied themselves, by correspondence with me (there are plenty of cases in the correspondence) they called for tenders, made their selection and sent it up to the Director-General of Stores for concurrence. He satisfied himself that it was correct, that it was good business, and placed the contract for those stores. Messrs. Meik & Buchanan did the inspection.

Q.—The only link which is missing is the inspection by someone on behalf of Government either of the indent (since the price is attended to by the Director-General of Stores) or of the tenders. Either the indents or the tenders should pass through the Secretary to Government after scrutiny on behalf of Government by the Director?

A.—I suppose they thought the procedure which was adopted in this case was sufficient.

Chairman.—Thank you, Mr. Lewis.

(The Witness withdrew.)

The Committee assembled at 11 a.m. on the 28th October, 1926, all members being present.

55th Witness, Sir G. Buchanan, K.C.I.E.

WRITTEN STATEMENT.

BACK BAY RECLAMATION SCHEME: STATEMENT BY SIR GEORGE BUCHANAN, K.C.I.E., Kt.

The terms of reference to the Committee are as follows:—

(1) To enquire into the history of the inception and conduct of the Back Bay Reclamation Scheme.

(2) To make recommendations as regards future operations.

In the absence of any indication as to the matter upon which information is desired from me I propose in this statement to deal with the case under the following heads:—

(1) History of the inception of the scheme to May, 1919.

(2) My connection with the work from May, 1919, up to the date of its sanction by the Secretary of State for India.

(3) Conduct of the work.

(4) Summary and suggestions as to future operations.

History of the Scheme from its inception to May, 1919.

2. When I first examined the project in 1919 the various sources of information were made available to me and I took a number of notes which I showed to Sir George Lloyd, as exemplifying the great interest that had been taken in the matter for many years. The date of the first scheme was 1863, when a Company was formed to reclaim

1,500 acres of the foreshore, but owing to financial difficulties the Company was voluntarily wound up. In 1887 the Government of Lord Reay prepared a scheme on which no action was taken In 1897 a Committee was appointed by the Government of Lord Sandhurst to reconsider the matter and this Committee issued several reports and recommended that an accurate survey of the Colaba foreshore should be made. The Bombay Improvement Trust next prepared a project, and in 1904 a Committee entitled "The Military Lands Committee" contemplated the reclamation of very extensive areas in Back Bay for purely military purposes.

3. In 1905 the Bombay Public Works Department prepared four alternative projects for reclamation. On this occasion it was proposed for the first time to obtain filling by dredging from the harbour and pumping through pipe lines across the peninsula and tenders were received from various contractors. In 1906 the Bombay Public Works Department drew up a revised scheme for the reclamation of 973 acres in Back Bay and 121 acres on the harbour side of the Colaba Peninsula. In 1907 the Government of Lord Lamington appointed a Committee, presided over by Sir Walter Hughes, especially to consider this scheme and report upon its possibility and utility, probable financial results and best methods of carrying out the work. The Committee were not unanimous in their findings and no action followed.

4. Lord Lamington left Bombay in 1907 and was succeeded by Sir George Clark, now Lord Sydenham, and in February, 1908, the firm of Lowther & Company, Civil Engineers and Contractors (subsequently Lowther & Kidd), submitted the outline of a scheme for the reclamation of Back Bay and offered their services. In the first place they contemplated the reclamation of the whole of Back Bay, an area of 3,576 acres, or, alternatively, the reclamation of 2,945 acres. On the 16th July, 1909, they further addressed the Government of Bombay and said they had observed that the Government had issued a resolution on the subject of Bombay development, which, amongst other things, included a decision to prosecute an adequate scheme for reclamation in Back Bay, and they therefore placed their services at the disposal of Government to make the necessary surveys and investigations with a view to making definite proposals on a business basis. Apparently their offer was accepted, for, on the 27th October, 1910, they submitted a scheme for the reclamation of 1,272 acres at a cost of 358½ lakhs. They observed that they had been provided with all the data in possession of Government requisite for the consideration of the scheme, such as surveys of site, levels of ground, nature of sea bed and extent of material available for filling, and these they had supplemented by further surveys and an extended examination of the site, including a further series of borings in the harbour, so that, taken altogether, they considered they had ample data for the consideration of the project.

5. Messrs. Lowther & Kidd discussed at length the best method of carrying out the scheme, whether by Government itself or by means of a concession granted to a company or other similar agency, and finally recommended that Government should do the work at its own cost and risk through the agency of a firm of engineers and contractors. They accordingly tendered for the work on the basis of Government entrusting the execution to them as their fully empowered agents and paying a commission for their services of 5 per cent. on the cost, plus a bonus of one-fifth share in any savings effected on the sanctioned estimate. The report was accompanied by financial statistics in support of their proposals, general estimates for either the 973 or 1,272 acre scheme, and draft specification, conditions of contract, and form of tender.

6. On the 21st January, 1911, the Secretary to the Government of Bombay addressed the Secretary to the Government of India on the subject, giving the history of the various proposals up to date, and with reference to Messrs. Lowther & Kidd's offer for the 973 acre scheme he remarked that it was 36 lakhs less than the Government estimate for the same work, and he made the following recommendation:—

> "Detailed plans and estimates will be submitted when the general proposals are approved. For the preparation of designs of the plant and works, and for the execution of the work, Government propose to utilise the services of an engineer of wide experience of sea works, Mr. Kidd of the firm of Lowther & Kidd, who, as the Government of India are aware, carried out the Government Dockyard works in Bombay, and who has an intimate knowledge of the local conditions. The rates given above have been supplied by him, and he has expressed his willingness to prepare designs and working drawings, to place at the disposal of Government his extensive experience, to procure for Government the special prices at which manufacturers supply plant and materials to contractors, and to carry out the work at an inclusive charge of 5 per cent. on the outlay subject to a maximum of 5 per cent. on the estimate as finally accepted by Government after careful scrutiny. In order to give the firm an interest in carrying out the work as economically as possible Government propose a bonus of one-fifth of the saving that may be achieved. The reclamation will be effected

by means of suction dredgers working in the Harbour on the east of Colaba, where the presence of an ample deposit has been ascertained, and delivering the clay at the site of the reclamation—the most efficient and economical method of carrying out reclamation on a large scale. After the clay has settled, a layer of moorum, 1 foot thick, is to be spread over the whole area."

7. In the matter of Messrs. Lowther & Kidd's larger scheme for the reclamation of 1,272 acres the letter remarked that sections which had been taken indicated that the best and most profitable scheme would probably be one lying between the two schemes, and having a gross area of about 1,100 acres; that it was unnecessary at that time to prepare a detailed project, but immediately on receipt of the general approval of the Government of India and of the Secretary of State to the proposals submitted the Bombay Government would cause the necessary surveys to be undertaken and estimates to be prepared, when the whole question would be thoroughly re-examined from a financial point of view, and the most promising scheme submitted to the Government of India. Concluding, the letter went on to say that enough had been said to show that a scheme of reclamation would not only provide for an urgent need of the City of Bombay, but would also prove a sound financial undertaking of the nature of a productive public work which the Bombay Government regarded with great confidence. The Government of India was, therefore, requested to submit the proposals to the Secretary of State for his general approval, as the Governor in Council was anxious the actual work should be commenced with the least possible delay.

8. The Government of India's reply dated 14th October, 1911, stated that before any representations could be made to the Secretary of State it had to be made clear that the works would be reproductive, and for that purpose there was practically no data available. The Government of India did not wish to question the accuracy of the skilled engineers who had advised the Government of Bombay, but their figures had not been placed before the Government of India, and all that could be said on a general review of the case was that large estimates of that type were particularly liable to be exceeded, and that even in Bombay experience of reclamation on an open sea front of the type proposed was limited. On the proposal that the scheme, if undertaken, should be executed by Government in preference to private agency, the Government of India was not convinced, on the information before it, that the scheme, if undertaken, should be executed by Government in preference to private agency, and therefore asked that the matter should be further investigated. Finally, the Government of India asked what would be the cost of the detailed surveys and estimates, as these would be necessary before the scheme could be recommended to the Secretary of State.

9. The Government of Bombay again addressed the Government of India at length on the 6th December, 1911, and forwarded a letter from Messrs. Lowther, Kidd & Co., Civil Engineers and Contractors, offering to execute a detailed survey and investigation of the site for Rs. 1,57,500, i.e., estimated cost of survey, drawings, and estimate, Rs. 82,500, plus professional fee, Rs. 75,000. In making this offer Messrs. Lowther & Kidd stated that although they had no reason to doubt the substantial accuracy of the information on which preliminary schemes dealt with in their report on the 27th October had been based, they agreed that, having regard to the great extent and importance of the scheme it seemed desirable and necessary that the data upon which a definite and final scheme was to be formulated should be more extensive.

10. The following extracts from the Bombay Government letter are of interest :—

"In the first place I am to point out that no final scheme has been put forward at this stage for the acceptance by the Government of India or the Secretary of State. The two tentative schemes were explained with the object of proving that the reasons for believing that the work would be reproductive were sufficiently strong to justify expenditure on the more detailed investigation required for the preparation of a complete project.

"These reasons were fully set forth in Mr. Cameron's letter No. C.W. 133, dated the 21st January, 1911, but I am again to refer briefly to them here. The cost of the execution of a reclamation was first estimated by the officers of the Public Works Department, and the estimate thus obtained showed that the prospect of financial success was most promising. The Governor in Council felt, however, that complete reliance could not be placed on these figures, as no officer of the Department had practical experience of work of this highly special nature. Mr. Kidd, a partner in the firm of Messrs. Lowther Kidd, who possessed all the experience and knowledge required, and who was then in Bombay in connection with the extension of the Government Dockyard which was being carried out by his firm, was struck by the exceptional opportunity afforded by the stretch of rocky foreshore visible at low tide and offered to make a preliminary investigation of a project for reclamation, at his own expense. This offer was accepted by the Government of Bombay, as it afforded the best means of testing

the estimates of their own officers, whilst it involved no obligation to employ Mr. Kidd's firm for the execution of the work. The figures supplied by him confirmed those obtained by the officers of the Public Works Department. Provision was made in both estimates for all contingencies. In Mr. Porter's letter under reply, it is stated that experience of reclamation by suction dredging is 'limited' in Bombay. I am, therefore, to point out that the large reclamations being carried out by the Port Trust afford exceptionally complete data for estimating work of this kind.

"The Government of Bombay are satisfied that Mr. Kidd's figures may be accepted with safety as a sufficiently close approximation to the cost of the work to justify the further investigation of the scheme, and they clearly indicate that the scheme may be expected to be productive. Mr. Kidd's detailed estimates could not be supplied to the Government of India, as they are not officially in possession of the Government of Bombay, but an abstract estimate was so supplied. The Governor in Council has closely examined the figures and is convinced that they have been drawn up with due care and are sufficient for the immediate purpose in view, namely, to show that the reclamation scheme will be a reproductive public work and as such deserves detailed investigation.

"The Government of Bombay, being thus convinced that the scheme would be highly productive, laid before the Government of India their initial proposal that the scheme should now be examined in detail and that complete estimates of the cost of execution should be carefully prepared. Their second proposal at this stage dealt with this investigation and the preparation of the estimates.

"They proposed that this work should be entrusted to Mr. Kidd, and that his firm should eventually carry out the project for Government on the terms laid down in paragraph 14 of Mr. Cameron's letter. Mr. Kidd has special knowledge and experience of this class of work, and has, in addition, close acquaintance with local conditions owing to the work lately carried out by his firm in Bombay, the arrangements made for carrying out which work compared very favourably with those made on other large works in progress in Bombay. Further, the preliminary terms offered by him appeared to be very favourable to Government. If the investigation and the preparation of the estimates are to be entrusted to a firm of contractors, it appears necessary that they should carry out the work of reclamation in the event of its being approved; but it was not intended that their estimate should be accepted without careful scrutiny on the spot by an independent expert if such a person can be obtained.

"An alternative method of procedure is to employ an expert for the investigation and the preparation of the estimates, and to call for tenders for the execution. This alternative did not commend itself to Government, because it would not provide so satisfactorily for their control of the work. Further, Government are well aware that economy in this class of work can be attained only by securing that the suction dredgers and other plant required shall be of the best design. The difficulties which have arisen with the Port Trust dredgers serve as a warning on this point. It is also necessary that most careful consideration should be given to the arrangements for carrying out the work and to the order in which it must be undertaken, and this is more properly the work of the contractor than of a Consulting Engineer."

11. In due course the Government of India sanctioned the estimate for the detailed survey, remarking that it was presumed that the Government of Bombay would take such precautions as might be necessary to ensure the correctness of the Contractor's survey and report.

12. On the 3rd August, 1912, Messrs. Lowther, Kidd & Co., submitted their detailed project for the reclamation of 1,145 acres of land. The report was accompanied by 10 sheets of drawings, photographs, bill of quantities, schedules of rates and Actuary's report. Paragraphs 4 to 8, 22 and 23 of the report were devoted entirely to discussing the extent and character of the deposits in the harbour available for filling the area to be reclaimed and the suction dredger machinery proposed, and this is so important that I will quote these paragraphs *in extenso*.

"The survey operations fell naturally into three main divisions:—

(*a*) The extent and character of the deposits available for filling;

(*b*) The best attainable line for the sea wall; and

(*c*) Source of supply and character of moorum available for the subsidiary works.

Of these (*a*) was of chief importance, involving the feasibility of the scheme and being the chief factor in its cost.

(a) *Material for filling.*

The first point to receive attention was the nature of the sea bed to the westward of the proposed reclamation, as, obviously, if sufficient material of a suitable character could be obtained there, it possessed great advantages over any other possible source. This was quickly disposed of as the conditions are a very irregular rock bottom containing pockets or thin layers of loose sand in insufficient quantity within practicable distance and—for a great part of the year—a heavy ground-swell prevails which renders the work of dredgers dangerous, and frequently wholly impossible. The next source was clearly that part of the harbour bed adjacent to the western shore of the harbour and contiguous to the proposed reclamation. This, provided the material was suitable and available in sufficient quantity, presented conditions perfectly favourable in respect of sea exposure. Survey operations were consequently directed to ascertain the extent and character of the harbour bed over an area measuring 17,400 feet long by 9,000 feet wide. This was accomplished before the advent of the monsoon, and conclusively established the existence of an extensive convenient area of mud and clay, yielding within the area prospected more than three times the quantity of material required for the scheme now proposed.

Drawing No. 5 shows the results in detail of this part of our investigation. A system of boring by hydraulic tubes was devised which proved to be perfectly reliable as well as rapid in action. One thousand, three hundred and fourteen borings were sunk into the sea bed, of which the results of 1,159 are recorded in this drawing. These borings were in all cases sunk to the hard bottom—rock or moorum—or, where such a bottom was not found at a higher level, to the depth of 70 feet—and over—below low water level of ordinary spring tides.

(7) The character of the deposit was almost uniformly similar throughout—namely, silt overlying a deep bed of blue clay. The silt is of recent formation—speaking geologically—but the clay is an old deposit, and indubitable evidence of its having at some time been above sea level is afforded by the fact that it contains many trunks and branches of trees. For the purpose of filling and making up land the mud is sufficiently suitable, and the clay is eminently so. With good arrangements for draining out the water during construction the mud will make very good land after the lapse of a sufficient interval for drying. The clay, which is stiff and unctuous, hardens into perfectly solid ground in a very short time. As far as possible in course of execution of the works the clay would be preferred, not only because of its greater suitability for making land, but also because for dredging purposes its stiffer and more tangible character enables a higher percentage of solid material to be transported by the pumps.

(8) In brief it has been completely established that there is available more than three times the quantity of material required, all of it suitable for making up land and more than half of it eminently suitable both for this purpose and for economical transportation to the site.

Pump Filling.

(22) For making up land in the proposed reclamation the material has to be obtained from a greater depth and delivered to a greater distance than has hitherto been accomplished elsewhere. On the other hand great progress in the development of suction dredging machinery and methods has been made in recent years. This progress has been achieved mostly in the United States of America and the Dominion of Canada. In England, machinery and methods are backward and inefficient. We have consequently added to our own extensive experience in dredging a complete study of recent experience on the American Continent, and we have been in correspondence with the highest authorities on this subject there. As a result we have made provision for a very high class plant, and the working costs have been estimated accordingly. The machinery we would employ will be designed and guaranteed to effect the removal of 2,000 cubic yards of silt or blue clay per hour from a maximum depth of 70 feet below low water, and deliver it at any state of the tide to any part of the proposed reclamation. The question of the kind of power to be employed for operating this machinery is a most important one and we have made complete investigation of its cost by :—

(*a*) Steam,
(*b*) Electric Power, and
(*c*) Internal Combustion Engines on the Diesel System.

As regards (*b*) electric power. If generated by steam there would be a loss as compared with using direct steam. A rate quoted by the Hydro-electric

Company of 0·5 anna per Board of Trade unit does not compare favourably with results actually attained in Bombay by internal combustion engines. The advantages of electric power are confined to cases where the power is used at a number of points in small quantities, or intermittently, with a fairly regular load. These conditions do not obtain in this case. The pumping units are necessarily of very large power. The loss of energy in transmission, conversion, and in the motors would be heavy. But a controlling consideration is the extremely variable work of operating dredging machinery, where frequently it is running free one minute and encountering resistance to the point of " stalling " the next. This, with electric plant, would certainly result in increased losses by delays from breakdown.

(23) For the purposes of the present estimate we have as a result of our investigation based our cost estimates on steam power of the most modern and efficient type. But we think it very probable that we should decide to adopt for actual working (*c*)—the Diesel—or similar type of internal combustion engine. This would depend mainly on the cost of crude oil fuel at the time. For the present we have confined ourselves to arriving at a safe estimate of cost.

13. On the 7th August, 1912, the Bombay Government forwarded for the consideration of the Government of India Messrs. Lowther & Kidd's report and observed that the drawings might be considered as complete working drawings, which would give sufficient information for examination of the designs and for the immediate commencement of the work; the investigation had been most carefully made and might be accepted as exhaustive. The report was clear and complete, all doubtful points had been settled, and the revised estimate might be accepted as completely trustworthy and ample. It was further stated that in presenting this project to the Government of India the writer was to say that His Excellency had the fullest confidence in the ability and expert knowledge of Mr. Kidd, who had worked it out in detail; but in case it should be desired to obtain further expert opinion he was to suggest the names of Mr. A. W. Robinson, Montreal, who was probably the greatest living expert in the world on reclamation by suction dredging, and who was consulted as such by the Egyptian Government, and of Mr. C. S. Meik, the eminent consulting engineer of 16, Victoria Street, London, whose opinion on sea protection work might be accepted with confidence. The letter concluded that it was the earnest desire of His Excellency the Governor in Council that this project should receive the serious consideration of Government as highly productive work, an early prosecution of which was necessary for the growth and prosperity of the city of Bombay, and that it might be recommended for acceptance by the Secretary of State. The opinion was also expressed that the arrangement proposed by His Excellency for the execution of the work was the only arrangement which would ensure the efficiency and economy essential for the success of the scheme.

14. The decision of the Government of India on the letter from Bombay was to postpone consideration of the scheme, but to appoint a strong, fully representative committee to consider the general question of the future development of Bombay city. If, as a result of the deliberations of this committee, it should be decided that the reclamation of Back Bay was desirable, a beginning would be made by following the suggestion of Messrs. Lowther & Kidd, that is, to first take in hand the reclamation of an area of 84 acres, the cost of which was estimated at 37 lakhs, spread over four years.

15. It will be of use to quote here the considered opinion of the engineering adviser to the Government of India on the project submitted by Bombay. The late Mr. R. P. Russell, Secretary to the Government of India in the Public Works Department, recorded the following views in March, 1916.

" Whatever else may be said of it the Bombay Government seem to have examined this scheme exhaustively in the engineering aspect. Three estimates have been submitted :—

(*a*) For reclaiming an area of 973 acres, estimated cost Rs.284½ lakhs.
(*b*) 1,127 acres estimated cost 358½ lakhs.
(*c*) 1,145 acres estimated cost 325 lakhs.

The respective rates per square yard of every reclaimed gross area being 6·7, 5·8 and 5·86 rupees respectively.

Estimate (*c*) is the one on which the Government of Bombay pin their faith to. It provides for reclaiming 40 acres for future Government House, 205 acres for parks, 49 acres for gardens, 235 acres for roads and streets, 616 acres building area.

Messrs. Kidd & Co. have undertaken to carry out the work at their estimate of cost 325 lakhs. The estimate has been based upon rates sufficiently high

to cover any rise that may be expected to occur should the execution of the work be protracted for a considerable period; the actual rates obtaining between 1904 and 1908 for each class of labour as given in App. III, as also the corresponding rate used in the estimate. No details have been given as to how the actual rate for dredging has been arrived at. The estimate is upon a rate of 9 as ·3 pies per cubic yard which is equivalent to a rate of Rs. 2-5 per 100 cubic feet and Rs. 23 per 1,000 cubic feet. This rate includes the entire cost of the dredging plant, pipe line, pontoons, etc., etc. Excluding the cost of plant, a common rate for work of this kind varies from Rs. 5 to Rs. 10 per 1,000 cubic feet. This would include the cost of all establishment and working expenses in connection with the dredging work. In actual practice the cost of dredging may be as low as Rs. 2 to Rs. 3 per 1,000 cubic feet. Without a great deal more detailed information as to the number, cost, and capacity of the dredgers, length of pipe-line, necessity or otherwise of a shore delivery line, it is impossible to criticise the rate, but I should say that the rate of Rs. 23 should be ample. I may mention that the dredging of the Twante Canal in Burma, in many respects a much more difficult work, was estimated exclusive of depreciation of plant at Rs. 5 per 1,000 cubic feet of material dredged. The plant to be employed will be designed to dredge from a depth of 70 feet below low water to remove 2,000 cubic yards per hour. The length of the discharge pipe has not been stated. The detailed survey of harbour bottom adjacent to the western shore and continuous to proposed reclamation has been made over an area of six square miles, some 1,300 borings have been made down to hard bottom. The result shows that more than three times the total quantity of material exists, of which half is particularly suitable for the work. The estimate contemplates a reclamation level of nearly 3 feet above highest recorded tide level, the seal wall over about a mile of its length being carried out to a level of 6 feet. higher still this is nearly 8 feet higher than Cuffe parade and 6½ feet higher than Kennedy sea face. For the rest of the length the wall is carried to the same level as the reclamation, namely 3 feet above the highest known tide level. Presumably the greater height of the wall is limited to the length under greater attack, and has been determined by observations at site. Where the wall is carried to the lower level, it has been estimatd to cost at an average of about 220 rupees per lineal foot; elsewhere the rate has been taken at Rs. 456 per lineal foot. If the scheme is to be sanctioned it will probably be necessary to examine more carefully, and probably to call for further information in regard to this part of the work, which is estimated at about 65 lakhs. The type of wall proposed is suitable, but its cost is largely dependent upon the nature of the bed on which the mass of concrete or rubble blocks will rest, unless the bed is of rock, or of other hard formation, which seems to be the case on most of its length. The rate should contemplate a considerable mass of material to compensate for settlement. Generally, however, the estimate seems to have been prepared with great care, and probably contemplates this; altogether in its technical aspect the work appears to be quite feasible, and presents no insuperable difficulties with every likelihood, as far as can be judged, of being carried out at its estimated cost of Rs. 325 lakhs. Estimates (*a*) and (*b*), referred to in paragraph 1 above, were prepared by the Bombay P.W.D.; estimate (*c*) was prepared independently by Lowther & Kidd. The sufficiency of material has now been finally settled, and the closeness of the three estimates, namely, 6.7, 5.8 and 5.86 per square yard of gross area reclaimed coupled with the fact that a reliable firm of engineers is ready to execute the work at the last-mentioned rate may be taken as indicating that the estimate under consideration is probably as reliable as can be expected. The Bombay Government anticipate carrying out the work in eight years and the forecast is based upon that assumption, and the leasing out of an area of 60,000 square yards per annum commencing with the seventh year on the basis of 60,000 square yards of leasing per annum. The scheme cannot under the existing rules qualify as a productive public work. To qualify as a productive public work under the P.W.D. code, para. 1889, there must be good reason to believe that 10 years after completion the annual revenue will repay the annual interest including arrears of simple interest on capital invested. A statement has been prepared in this office, which shows that the scheme would qualify as a productive public work, if, commencing with the fourth year, an annual area of 130,000 square yards could be leased out until the eighth year, and 210,000 square yards per annum from the ninth year to the nineteenth year. It may be assumed at once that these conditions are impossible.

16. In November, 1912, the Government of Bombay appointed a Committee of prominent and representative citizens to investigate the financial features of the scheme, and to answer a series of questions dealing with the need for reclamation, the probable demand for building sites, the effect upon the value of existing landed property in Bombay, and other important matters. This Committee reported on the 22nd

January, 1913, and concluded their remarks by saying that they wished to lay stress on the fact that the scheme was not only financially sound, but that it would add to the beauty of the City, and after some years would add considerably to the resources at the disposal of the Improvement Trust in its efforts to reclaim insanitary areas.

17. On the 11th March, 1913, the Government of Bombay again addressed the Government of India on the subject, and after recapitulating briefly the steps which had been taken, and quoting the findings of the recent Committee, urged that sanction should be accorded to the work, and that either the Government of Bombay should be empowered to raise the successive annual loans required, acting as agents for the Government of India in the matter, but accepting the risk; or that the Government of India would provide the necessary sums as in the case of other productive works. The Government of India, however, was still unconvinced and expressed the opinion that a strong representative Committee should be invoked to consider the future development of Bombay City in all its bearings, and expressed the view that if the Committee were in favour of the Back Bay scheme, a beginning should be made with a strip of land measuring 84 acres, at an estimated cost of Rs. 37 lakhs, when the validity of the estimate and the demand for land would be tested by this experiment. The Bombay Development Committee was accordingly appointed by Government of Bombay Resolutions dated October and November, 1913, and their report was issued in April, 1914. This report contained no specific recommendation to undertake reclamation in Back Bay on a large scale, but suggested than a area of 100 acres should be reclaimed in order to provide accommodation for certain urgently required public buildings.

18. Several alternative schemes of reclamation were prepared in the following three years, and on the 15th September, 1916, the Government of Bombay asked the Government of India for permission to proceed with a scheme for reclaiming 220 acres, but the Government of India replied in February, 1917, that the 220-acre scheme was not in accordance with the decision arrived at in 1913, and it regretted it was unable to entertain the proposal. If, however, the Government of Bombay should submit a more modest scheme on the lines proposed by the Development Committee, and could satisfy the Government of India that it could be worked from provincial resources, it would be prepared to give such a scheme their careful consideration. The matter then dropped until the end of 1917, when there was a sudden revival of interest in the scheme, which came to a head during the temporary boom in land values and trade which took place at the end of the war. It will, I think, be interesting to describe the various groups who were anxious to see Back Bay reclaimed and their negotiations with the Government.

Sir Sassoon David Group.

On the 8th December, 1917, a group headed by Sir Sassoon David addressed the Government of Bombay on the subject of the Back Bay Reclamation Scheme, 1912, and asked for a concession, as they proposed to float a company with the necessary capital. On the 21st December they wrote that the whole of the capital required was assured, and as soon as Government granted permission the work would be proceeded with. On the 10th January, 1918, the syndicate wrote to the Government of Bombay, and said that they intended to carry out the work according to the intended programme of Messrs. Lowther, Kidd and Co. They would form a joint stock company, and raise the necessary capital, and would call up 6 lakhs of rupees to meet the first year's expenditure. On the same date a meeting was held in the Hon. Mr. Carmichael's room in the Secretariat, and the proposals of the syndicate were discussed in some detail.

Messrs. Tata Sons, Ltd.

On the 19th December, 1917, Messrs. Tata and Sons wrote a letter to the Secretary to the Government of Bombay, General Department, and, after reciting the history of the scheme since 1911, asked for an option on the reclamation of Back Bay for two months, and a statement of the general terms on which the Government would be prepared to entrust this work to a private corporation, as, if an option were granted, they would at once engage the requisite engineering staff to prepare a scheme. In that case they asked that their engineer should be allowed to study the papers relating to the project.

On the 3rd January, 1918, the Joint Secretary, P.W.D., Bombay, wrote to Sir Dorab Tata, saying he was given to understand that Messrs. Tata and Sons were still prepared to submit proposals for the reclamation scheme in Back Bay, and that on looking up the history of the project he found that the Tata firm first became interested in the year, 1911, when Mr. Padshaw addressed Mr. Cameron. On the 15th January, 1918, a meeting was held in Mr. Carmichael's room in the Secretariat, at which were present the Hon. Mr. Carmichael, now Sir George Carmichael; Mr.,

now Sir Stanley, Reed; Mr. A. J. Billimoria, a partner in the firm of Tata Sons, Ltd.; and Mr. Kent, Joint Secretary, Public Works Department. After discussion Sir Stanley Reed said that Government should state the conditions on which the Government were prepared to grant a concession, and Mr. Billimoria stated that Sir Sassoon David was prepared to join Messrs. Tata as members of the syndicate to be formed, and besides this powerful backing the scheme would have the resources of the Tata Industrial Bank at their disposal. The papers were then forwarded to the Governor in Council.

19. On the 5th February, 1918, Sir Sassoon David's syndicate wrote to the Secretary to the Bombay Government, and said that they understood that Tata Sons, Ltd., had also made an application to Government for an option on the scheme, and requested that their application should be considered as included in the application of Tata Sons, Ltd. On the 12th February, 1918, Messrs. Tata Sons, Ltd., addressed the Bombay Government, stating that the firm of Tata Sons, Ltd., with whom the Tata Industrial Bank was associated, had amalgamated with the Sassoon David syndicate, and requested that Government would please to reply to their application of 19th December as promptly as circumstances would allow, because the present was a particularly favourable opportunity of securing public subscription to the necessary funds.

20. On the 2nd April, 1918, Messrs. Tata again addressed the Bombay Government, and observed that they had not been favoured with a reply to their application for an option. They had already completed arrangements to appoint a local engineer, and were in negotiation for the engagement of the services of one of the best engineering firms in London to advise them generally on the engineering details of the scheme. On the 5th April Sir Dorab Tata wrote to Mr. Carmichael, forwarding particulars of the career of Sir Maurice Fitzmaurice, who was mentioned as the engineer proposed by the syndicate.

Messrs. Lowther and Kidd.

21. Messrs. Lowther and Kidd, whose offer to carry out what is known as the 1912 scheme was rejected by the Government of India, although strongly supported by Lord Sydenham's Government, still kept a watchful eye on the proceedings, and some time in the autumn of 1914 Mr. (now Sir) Claude Hill had an interview with Colonel Claude Lowther at the Marlborough Club, London, as a result of which Colonel Lowther wrote on the 1st October, 1914, to Sir Claude Hill, then a member of the Bombay Government asking (1) whether the work if undertaken would be carried out on the basis of their offer, and (2) whether the work would be entrusted to his firm. He said he did not want to hustle the authorities, but in view of further delay and possible changes in Government personnel a prompt decision on these two points would be of mutual advantage to all parties concerned, and as he understood Sir Claude Hill thought the proposal a fair one, he did not hesitate to put it forward in writing. The letter was noted on by the Secretary of Government, who observed that it was a natural request, and as Mr. Lowther said he had no intention to bind Government in any way to the construction of the work, he thought the answer should be in the affirmative. His note was dated 5th November, 1914, and was endorsed by the Governor in Council. A letter was then sent to Mr. Lowther by Sir Claude Hill in the following terms :—

> " In answer to your letter of the 1st October, 1914, I am glad to be able to assure you that should this Government decide upon carrying out the Back Bay Reclamation Scheme for Bombay, it is their present intention to undertake it, so far at least as concerns the lesser project, now under consideration at their cost and risk, and on the lines suggested by you in the report you submitted to Government, dated 3rd August, 1912.
>
> " The work may, of course, have to be deferred for a considerable time owing to the war, and will probably be carried out very gradually for reasons of finance and for convenience in various ways, but I am able to say that Government intend to employ your firm as their agents for the execution of the work, and they are prepared to agree in a general way with the terms you suggest for the services you propose to render as described in paragraphs 35 and 36 of your report of the 3rd August, 1912. I hope this assurance is sufficient for your requirements."

22. On the 26th March, 1915, a copy of the letter was sent to Mr. Kidd who, in the course of reply dated 20th April, 1915, observed : " I now thank you for having written giving us a definite assurance that Government will employ us as their agents for the execution of the Back Bay Reclamation works, and that they agree in a general way to the terms of Clauses 35 and 36 of our report of the 3rd August, 1912. Your assurance is quite satisfactory to us, and we shall hold ourselves at the disposal of the

Government when they are ready to proceed." Subsequently Colonel Lowther claimed that the letter from Sir Claude Hill constituted a definite promise to his firm for the execution of the work if and when sanctioned by Government, and in a letter dated 18th October, 1917, he emphasised this point of view in a private letter to the late Mr. Montagu, then Secretary of State for India. At a later date, of which there is no record, Colonel Lowther and Mr. Kidd appear to have dissolved their partnership, and on the 24th October, 1917, Colonel Lowther wrote to Sir Claude Hill saying that Parliamentary and other duties prevented his going to India for the moment, but that he had entrusted his old and valued friend, Colonel Grisewood, with the delicate mission of explaining personally the whole story of the dissolution and also he said that he had entered into partnership with Sir John Norton-Griffiths for the purpose of carrying out public works in India and that the merging of the two firms placed him in a strong position for executing marine and harbour work. In due course Colonel Grisewood arrived in India, and on the 9th March, 1918, he wrote to Mr. (now Sir) George Carmichael, sending particulars about the firm of Lowther & Griffiths and enclosing a copy of a letter he had written to the Tata Syndicate, asking that Lowther, Griffiths & Co. should be appointed their supervising constructing and consulting engineers.

23. On the 26th March, 1918, Colonel Grisewood addressed an official letter to Mr. Carmichael informing him that his negotiations with the Tata Syndicate had fallen through, and he had instructions from his principals, Messrs. Lowther, Griffiths & Co., to apply for a concession for the work on their behalf, and that he would be glad to know the requirements of the Government of Bombay so that the application for a concession could be framed so far as possible to meet their wishes and views. He also stated that in an interview with His Excellency the Governor towards the middle of December, 1916, His Excellency had informed him that Government had decided to entrust the Back Bay Reclamation Scheme to private enterprise.

24. Following on this correspondence, a deputation consisting of Sir Stanley Reed, Sir Sassoon David, Mr. D. Barocha and Mr. A. J. Billimoria, waited on the Governor of Bombay, and asked for an option on the concession (1) in order that they might secure promise of support, and (2) to warrant them in obtaining an expert engineer from England to report on the scheme. The Government of Bombay decided that a report should be obtained from an independent expert. Colonel Grisewood and the Tata Syndicate were informed accordingly.

Sir W. G. Armstrong Whitworth & Co., Ltd.

25. Mr. Kidd, after dissolving his partnership with Colonel Claude Lowther, joined the firm of Sir W. G. Armstrong Whitworth & Co., Ltd., as head of their Civil Engineering Department, and on the 24th January, 1919, Sir W. G. Armstrong Whitworth & Co., Ltd., Civil Engineers and Contractors for Public Works, addressed the Government of Bombay submitting a tender for the reclamation of 350 acres of land which they said conformed to the scheme of 1912 in the main line of sea frontage and would become absorbed as an integral part of that project should it ultimately be carried into effect. They observed that in connection with the scheme they desired to emphasise that by far the most important item governing the ultimate total cost was that of dredging, which arose from the fact that in no part of the world had any similar work been executed under anything like the same conditions as to depth from which material had to be obtained combined with distance to which it had to be delivered. In this connection it may be noted that Mr. Kidd had increased his price for mud filling to 4 Rs. per cubic yard.

26. At this time there were three parties asking for a concession to carry out the work (two of whom ultimately combined into one syndicate) and one firm of engineering contractors asking for a contract, and on the 9th December, 1918, the Joint Secretary to the Government of Bombay P.W.D. addressed the Government of India saying, that the Bombay Government had always recognised, that before the estimates prepared by Messrs. Lowther & Kidd in 1912 could be adopted, it would be necessary to have them scrutinised by an independent expert on the spot; for these reasons they desired to have the scheme examined by the best expert whose services could be secured. His report would enable them to calculate with greater approximation what the value of the concession was likely to be. The expert, said the letter, should be one who had experience in harbour and reclamation works, and the knowledge of recent developments of dredging and pumping appliances. As regards the fee Government was prepared to pay a reasonable sum, but preferred to leave the matter to the Secretary of State instead of fixing a limit which might exclude the one expert whose advice would be of most value in this particular case.

27. On the 25th January, 1919 (by which date Lord Willingdon had been succeeded at Bombay by Sir George Lloyd), the Secretary of State for India asked the Government of India by telegraph whether the latter agreed with the Government of Bombay that

the expert to be selected should be an independent person as he had received from the firm of Lowther & Griffiths an offer to send out two of the firm's engineers to revise the estimates, and urging that, as the scheme had been prepared by the firm, they should be given an opportunity to do the work. The Government of India, in a reply dated 5th March, 1919, gave a history of the scheme, and concluded its observations by stating that it was in agreement with the Government of Bombay that with a view to a settlement of this long outstanding question, the project should be examined by the best expert available, so that an authoritative opinion on the scheme might be obtained, and the closest possible estimate of cost be framed. The expert selected, the Government of India thought, should be one who had large experience on harbour and reclamation works, and knowledge of the most recent dredging and pumping appliances, and, as suggested by the Government of Bombay, should be entirely independent of any of the firms that had applied, or were likely to apply for the concession. For this reason it had excluded the firms of Lowther & Griffiths, Messrs. Tata & Co., and Sir W. G. Armstrong, Whitworth & Co., of which Mr. Kidd was a member.

28. Following on this despatch there was some discussion in Bombay between Sir Claude Hill, then a member of the Viceroy's Council, and the Governor of Bombay, and a telegram was sent, dated 8th April, 1919, from the Governor of Bombay to the Secretary of State as follows :—

> " Back Bay Reclamation Scheme : Government of India has asked you to send out best expert available to examine and make final report on above. Government of India has also asked us to send all plans to Delhi for transmission to you in order that expert may study them before departure. (1) I think this procedure involves unnecessary delay in view of the fact that expert must be here to see conditions just before monsoon breaks as well as after it. (2) I have consulted Government of India, and Sir Claude Hill concurs in proposing you should send expert out at once to arrive Bombay not later than the third week of May. (3) All plans and information essential to expert's study now here. (4) Lord Sydenham or W. L. Cameron, late Chief Engineer, Bombay, would advise regarding choice of expert. (5) Failing your ability to find expert in short time available, my Government would agree to using Sir George Buchanan, whose services would probably be available, and whom the Government of India recommend. (6) My telegram has been drafted in consultation with the Government of India, and is being communicated to them. (7) Please telegraph immediately whether expert can be found in time to arrive by middle of May, or whether we should proceed with Buchanan."

29. On the 7th May, 1919, I received the following telegram from Sir George Lloyd, as he then was :—

> " My Government are desirous of securing your services at once to examine and report upon the Back Bay Reclamation Scheme ; all plans and data are here ; it would involve your being in Bombay before the break of the monsoon and for as long afterwards as you found necessary for production of your report. Please telegraph informing me whether you will undertake the work, and in following letter suggest terms."

My connection with the work began from that date.

30. The foregoing brings the history of the case up to May, 1919, and I have gone into the matter in some detail in order to show that so far from the scheme having been prepared in secrecy and forced upon an unwilling people by an arbitrary Government, every possible opportunity for years had been given for free discussion, and that no less than 18 different projects had been discussed. The Government of India certainly showed no disposition to rush the matter, and in a letter from Mr. Montagu, then Secretary of State for India, to the Viceroy, dated 7th November, 1918, occurred the following paragraph :—

> " I still feel a little anxious about the Back Bay Reclamation Scheme in Bombay. My views are that it should be put forward as a valuable contribution to the housing difficulty in Bombay, but my views are very strongly on the evidence before me that if it is undertaken it should be undertaken as a Government enterprise and not given to any concessionaire."

This point of view was also emphasised by Mr. Montagu in an interview I had with him on the 17th July, 1919.

(2) *My connection with the work from May, 1919, up to the date of sanction by the Secretary of State.*

31. When I received the telegram already quoted from Lord Lloyd I was a member of the Government of India Munitions Board, but the War was over and I was on the point of terminating my duties with the Munitions Board, so I telegraphed

my acceptance of the offer and in a letter from Simla, dated 12th May, to Sir George Lloyd, I made the following remarks :—

" The work is of a kind with which I am familiar, as I designed and carried out the very large river training and land reclamation scheme on the Rangoon river, whilst I was also responsible for initiating all the reclamation works at Basra, which have transformed the river front on the Shatt-al-Arab.

" I have seen Sir Thomas Holland to-day, and I have arranged to leave Simla for Bombay on the 17th instant. I have at present only a superficial knowledge of the Back Bay scheme, but I assume that plans, cross-sections and borings are available (as there would certainly not be time to have these prepared before the monsoon), and that the reclamation is proposed to be effected by dredging outside a retaining wall marking the limit of reclamation and depositing inside the wall. In that case one of the principal problems would be to decide on the best type of dredger, and whether at the present greatly enhanced price of these machines the scheme would be practicable from the financial point of view? You suggest that I should view the locality before the break of the monsoon, and thereafter stay in Bombay until the completion of my report, but if the question of dredgers is the crucial one, and you wish for a reliable estimate, I am disposed to think that it would be preferable before committing myself to figures for me to go home with the papers, having obtained all local information, in order to discuss the dredger problem with the various builders who have done work for me in the past, as, although I can decide on the best type of dredger, I cannot, in the present state of the market, put prices upon them. These details can, however, be decided after I have gone over the available data."

32. I arrived in Bombay on the 19th May, 1919, and at once got in touch with the Honourable Member, Mr. Curtis, and other Government officials, whilst the Public Works Department placed at my disposal all Mr. Kidd's plans and papers. On the 21st May, 1919, I received a letter from Sir George Lloyd saying he was very glad I had consented to undertake the Back Bay Report, and he hoped to see me shortly in Bombay; also that he thought the whole scheme depended upon the mammoth dredger, its cost, and when it could be sent out, and that he believed this was the biggest dredging scheme ever contemplated and as such would, he was sure, interest me.

33. On the 23rd May, 1919, I wrote again to Sir George Lloyd saying that I had gone through all the plans and papers and had been able to form an idea of the work required; that so far as the sea wall was concerned there was no engineering difficulty, but that as I thought would be the case, the crux of the whole scheme lay in the provision and successful working of the dredger or dredgers, and that under these circumstances the sooner I got home to tackle the dredging problems with builders of dredging plant the sooner he would be able to decide on the best action to take. I therefore suggested that when I had received the terms of reference I should go home on the 31st May, and, having prepared a specification for the dredging plant and obtained full particulars and prices, I should return to Bombay with the whole scheme and estimates ready for consideration by the Bombay Government.

34. On the 28th May, 1919, I had an interview with Sir George Lloyd and handed him a note I had prepared, giving the history of the case since 1910. Sir George Lloyd discussed with me my terms of reference, asked me a number of questions, and said that the Back Bay scheme had for years past impeded progress in Bombay. He would give me his entire and absolutely confidence and if I said the scheme was impracticable he would turn it down at once and start on something fresh, but once my opinion was given he would refuse to allow any other expert to report, and he asked me not to let him down.

35. On the 29th May, I wrote to the Joint Secretary, Government of Bombay, Public Works Department, as follows :—

" With respect to the proposal to obtain my professional opinion and advice on what is known as the Back Bay Reclamation Scheme, I have read the terms of reference, and beg to reply as follows :—

" 2. I have examined the site on several occasions, and have satisfied myself that the survey and borings made by Mr. Kidd are sufficient to enable me to write my report.

" I am already intimately acquainted with the monsoon conditions in India, and, therefore, do not require to study them afresh on the spot.

" 3. The crux of the work consists in the provision of adequate dredging plant, and to enable me to deal satisfactorily with this matter it is necessary that I should go home and place before the leading builders a specification of the plant required and obtain estimates for the same."

36. On the 30th May, the Government of Bombay in acknowledging my letter stated they would be glad to avail themselves of my professional opinion and advice and desired me to undertake the preparation of the report referred to forthwith, in accordance with the following terms of reference :—

(1) To examine and report on the scheme prepared by Mr. Kidd, of Messrs. Lowther, Kidd & Co. for the reclamation of 1,145 acres in Back Bay, Bombay (known as the 1912 project), or any portion thereof, which Government may thereafter designate.

The scheme comprises

(*a*) the construction of a sea-wall;

(*b*) filling in within the area enclosed by the sea-wall by means of dredging in the harbour on the east side of the Colaba peninsula, and pumping the material across the narrow neck at various points in the Back Bay;

(*c*) covering with a layer of moorum the lands so reclaimed.

(2) A specific opinion is required on the following points :—

(i) the practicability of the scheme from the engineering point of view;

(ii) the suitability of the type of wall proposed, or alternate suggestions for better types;

(iii) the suitability of the proposed method of reclamation by means of dredging, or alternative proposals for same.

(3) Mr. Kidd in his project of 1912 gave a general estimate for the above, but unaccompanied by details of cost of dredgers and other plant. A revised estimate is required for the whole of the scheme giving details showing

(*a*) cost of dredging plant;

(*b*) cost of dredging;

(*c*) cost of sea-wall, along with the price of plant in connection with the same;

(*d*) cost of moorum filling and plant required.

(4) A programme of construction is required along with an opinion as to the order in which the work should be executed, and the time within which the various sections could be completed from the date of the order to begin the work.

The question whether the entire work should be given out as one complete contract or divided up into a number of small contracts may also be considered, and whether it might not be advisable to carry out some items of the project, or even the whole of it, departmentally.

(5) A separate report and estimate on above lines is required for the reclamation of the east of the peninsula from pilot pier to Sassoon Dock, known as the East Colaba project, and an opinion as to whether it could be carried out by dredging plant already in Bombay.

37. Having obtained all the information possible to enable me to make a report, I left Bombay for England on the 31st May, 1919, arriving in London on the 25th June, 1919. Shortly after my arrival I joined the firm of P. W. & C. S. Meik of Westminster in accordance with an arrangement of some years' standing. Mr. Meik, the senior member of this firm, was admittedly one of the most talented and experienced engineers in this country, and he was the gentleman, as already recorded by me in paragraph 13, who had been recommended by the Government of Bombay to the Government of India as the eminent consulting engineer whose opinion on sea protection works might be accepted with confidence. I had the advantage of Mr. Meik's co-operation and assistance in the preparation of my 1919 report, and subsequently he was closely associated with me in all that we did in connection with the Back Bay Reclamation work until his death on the 5th July, 1923. We recognised at once that the crux of the scheme lay in the efficiency of the dredging plant and success of the dredging operations, and on these matters we concentrated our attention. We had both had great practical experience with dredgers of all types and in dredging. It has been suggested in the course of the Enquiry that I had not the experience necessary to advise Government on the reclamation works at Bombay; I will therefore describe a few out of the many public works with which I have been connected in various parts of the world.

38. The Rangoon River Training Scheme, which was the largest of its kind in the world, had been completed by me in 1913 at a total cost of £921,783, in eighteen months less than the estimated time and for £78,000 less than the sanctioned cost. For this I had received the honour of knighthood. In this connection I quote from

some remarks made by Sir Harvey Adamson, K.C.S.I., late Governor of Burma on the 21st March, 1916, at a meeting of the Institution of Civil Engineers :—

> " When he (i.e., Sir Harvey Adamson) left Rangoon a few months ago, not only had the work been completed well within the sanctioned estimate of a million pounds, but its success had been assured. The deep-water channel had returned to its original position. The sandbanks on the Rangoon shore had almost entirely disappeared. Silt had been deposited behind the wall, raising the surface above low-water level and thus reclaiming a considerable area of very valuable land, and the wall itself stood absolutely firm. In fact, every object that had been expected from the scheme had been realised. It was a matter of gratification to him that the Author's services to the port of Rangoon had been rewarded with knighthood; he had proved himself to be a great engineer and a great administrator. The Author's success in Rangoon had led to his being selected for engineering war work, and he was at present engaged on river works in connection with the Mesopotamia Expedition. He was quite sure that the Author's work for the Empire would be as good, as useful, and as thorough as had been his work for the port of Rangoon."

39. In 1913, as a result of the work done by me at Rangoon, the Foreign Office approached the Government of India with a view to securing my services to represent British interests on an International Commission that was to be set up in connection with the conservancy of the Shatt-al-Arab and development of the port of Basra. The War intervened, and the proposal naturally dropped. In 1915 I was sent to Mesopotamia at the special request of the Secretary of State for India. I was responsible for the reorganisation of the port of Basra, for the vast dredging operations in connection with a channel 15 miles long across the Hamar Lake, the dredging in connection with the Shatt-Al-Arab Bar and the reclamation of considerable areas of land at Basra, suction cutter dredgers of large capacity being employed in each case. For these works I received the honour of the K.C.I.E. and a letter from the Government of India, from which the following is an extract :—

> " I am also to convey the appreciation of His Majesty's Secretary of State for India of the valuable services rendered by you in the appointment mentioned, and to say that the Government of India associate themselves with the Secretary of State's appreciation of your work. The success of our arms in Mesopotamia has been sensibly promoted by your valuable advice, great powers of organisation and experience of the conditions of Indian ports."

40. In discussing the question of dredging at Bombay between ourselves, i.e., the firm of Messrs. Meik & Buchanan and firms of dredger builders, we considered that we were reasonably safe on two points, viz.: the area over which dredging should take place and the precise nature of the material to be dredged. The scheme on which we were asked to report had already been definitely accepted by the Government of Bombay and had been sent to the Government of India for sanction. I cannot recall in my professional experience a single instance where more complete borings had been taken. The results had been accepted by the Bombay Government engineers and by the Secretary of the Government of India in the Public Works Department, who is the highest engineering authority in India, and this officer had commented on the fact that the detailed survey of the harbour bottom had been made over an area of 6 square miles, some 1,300 borings having been taken down to hard bottom, the result showing that more than three times the quantity of material existed, of which half was particularly suitable for the work, and that sufficiency of material had been finally settled. In the matter of the area available for dredging, Sir Lawless Hepper has, in his statement to the Committee of Enquiry, definitely held me responsible for selecting an area which afterwards was curtailed. The fact is that what was placed before me was a project approved by the Government of Bombay for dredging over a certain area. It was not for me to question whether this area actually was available, and for any consequences that have followed a curtailment at the instance of the Port Trust and Indian Marine I have no responsibility whatever.

41. During my stay in England I was largely occupied with discussing in detail the dredger, and I spent some time at the works of Messrs. Simons & Company going into matters with their technical staff. In August, Sir John Norton-Griffiths and Colonel Claude Lowther called on me and sent me copies of the correspondence that had passed between them and the Bombay Government.

42. I completed my report by the middle of October, 1919, and sailed again for Bombay on the 24th October, arriving on the 14th November. On arrival I presented my report to the Bombay Government, and I stayed with His Excellency the Governor for a week in order to discuss the scheme to the fullest possible extent. My report was dated September, 1919, and I wish again to emphasise the point that I was not initiating a new project: I was reporting on a scheme prepared by Mr. Kidd, of Messrs, Lowther,

Kidd & Company, Contractors, for the reclamation of 1,145 acres in Back Bay, Bombay, known as the 1912 project, and this scheme had already been accepted by the Government of Bombay in 1912, who had stated in a letter to the Government of India that the drawings might be considered as complete working drawings, which would give sufficient information for examination of the designs and for the immediate commencement of the work. The investigation had been most carefully made and might be accepted as exhaustive. The report was clear and complete, all doubtful points had been settled and the revised estimate might be accepted as completely trustworthy and ample. Such a letter from a responsible Government pre-supposes that all such questions as the right to dredge within the area selected by Mr. Kidd had been considered and disposed of. After going at some length into the history of the scheme I dealt with the various points in the terms of reference and said that the absence of details in Mr. Kidd's plans and estimates made it difficult for me to report on his scheme as fully as I should have liked to do, or to examine his figures of cost from a technical point of view; that it was usual, when preparing estimates for a project of this magnitude, for all details to be furnished, but that in this case details were left to the imagination, and that with reference to dredging no particulars were given as to the capacity of the dredger, size, length, and cost of pipe lines and the cost of working the dredger. In this connection, Sir Frederick Hopkinson has remarked that in matters of detail there was little to choose between my report and Mr. Kidd's, but I would observe that Mr. Kidd's report was accompanied by 10 sheets of drawings and was supposed to be a complete working project, whereas mine was the usual report prepared for a client prior to the preparation of working drawings and specifications.

42. I agreed that the scheme was practicable from an engineering point of view; that there was an abundance of material in the harbour for the filling, and that it could be deposited in the area to be reclaimed by means of modern suction dredgers much cheaper than in any other way. I noted that paragraphs 5 to 8 of Mr. Kidd's report were devoted to an analysis of the material in the harbour and the quantity available for dredging purposes and that, according to Mr. Kidd, it had been completely established that there was available more than three times the quantity required of suitable material. I said that on the assumption that Mr. Kidd's borings and surveys were correct (and I saw no reason to doubt their accuracy as a great many borings had been taken) I accepted his conclusion both in respect of quality and quantity of material. In this I consider I had full justification, as I do not believe any responsible engineer, in the face of such overwhelming evidence as to the nature of the material, would be so foolish as to say he wished to take up another year's time (to say nothing of the expenditure involved) in making fresh investigations. The borings were taken in 1912, and the structure of the earth does not usually change in seven years.

44. I did not agree with Mr. Kidd that better dredgers could be obtained in the United States or Canada than in this country; in fact I said my own experience was exactly the reverse, and I was unable to concur with Mr. Kidd's remarks on the subject of power to be employed for operating the machinery.

45. Finally, I submitted plans, specification and tenders for dredging plant by British firms, also an analysis I had prepared of the working cost of the dredgers. I modified and very considerably cheapened a section of the wall proposed by Mr. Kidd for reasons given in my report, and I disagreed with Mr. Kidd that there was any prospect of opening up a quarry on the site of the works. I prepared an estimate amounting to 367.61 lakhs, and remarked that I had gone into the matter very thoroughly and believed my figures to be reasonable and reliable. I noted that I never over-estimated an estimate because, although by so doing an engineer might get the credit for not exceeding his estimate, such a practice was not conducive to economical work, so that I preferred to make a fair estimate on the data available and try to keep within that amount.

46. In the matter of carrying out the work I expressed my disapproval of Messrs. Lowther and Kidd's proposal to carry out the work as agents to Government on the basis of 5 per cent. commission on the cost, and said the usual and best method of carrying out a large public work was to follow one of three courses :—

(1) Tenders to be invited for the execution of the whole work on working drawings, specifications, bills of quantities, and conditions of contract supplied by the engineers entrusted by Government with the project.

(2) The work to be divided into sections, and tenders to be invited for each section on the above lines.

(3) The work to be carried out departmentally on working drawings, specifications, and estimates prepared by the engineers entrusted by Government with the work.

Finally, I remarked that if I thought there were any contractors who possessed adequate dredging plant I should recommend tenders to be taken for the whole work, but that as

I knew there was no dredger yet built suitable for the work, and that new plant must be obtained, I recommended one of two courses :—

(1) (*a*) Tenders to be asked for the construction of the sea-wall and a contract placed if a satisfactory offer is received.

(*b*) Tenders to be also asked for the moorum filling and construction of roads, drains, etc., and either one contract or several smaller contracts to be arranged.

(*c*) The Government to purchase the dredging plant and carry out departmentally the work of filling the area to be reclaimed.

(2) The whole of the work to be carried out departmentally, making use of local contractors for small contracts.

I expressed my preference for the first course if a suitable tender were received for the construction of the wall, and in any case I recommended the preparation of working drawings, specifications, and bills of quantities, and a consideration of the tenders received, before thinking of doing the whole work departmentally. The programme of construction I suggested was as follows :—

(1) Order dredging plant,
(2) Order railway tip wagons,
(3) Open up quarries for stone and moorum,
(4) Begin building wall from Colaba end.

47. On the 24th November, 1919, under instructions from the Bombay Government, and accompanied by a Secretary to Government, I proceeded to Delhi to discuss the scheme with the Government of India, and had a series of conferences with the Member of Council concerned, the Finance Member, and the Secretary to the Government of India, Public Works Department. On the 29th November I left Delhi for Bombay, and was given to understand that so far as engineering details were concerned, the scheme would be approved by the Government of India. On the 1st December, 1919, I had another interview with Sir George Lloyd, who said nothing more could be done until the sanction of the Secretary of State had been received to the project, but he expressed a wish that if the work were carried out my firm should be the engineers, and he asked me to make proposals on those lines and indicate how the work should be proceeded with.

48. Sir George Lloyd said definitely and repeatedly that he did not wish the work to be carried out by the Bombay Public Works Department, and on the 3rd December, 1919, I submitted a note giving my views as to the execution of the work on the supposition that my firm would be the engineers. I also pointed out that it must be borne in mind that, although sufficient information had been obtained to prepare a project and a reliable estimate no working plans and specifications had yet been made, and one of the duties of the engineers in England would be the preparations of working drawings and specifications.

49. At the time this memorandum was prepared the Bombay Development Directorate had not been created, and I understood my firm would be in sole charge and control, and that our resident engineer would be free from the numerous restrictions on the economical execution of work which obtains in India on works carried out by Government; this was indeed a matter which Sir George Lloyd (as he then was) discussed with me on more than one occasion. I recommended that the dredging should be done departmentally, and the opening of quarries and construction of the wall entrusted to local contractors. In this I was influenced by Sir George Lloyd's anxiety to have the work started before the break of the next monsoon, and because at that time no responsible contractor would have undertaken the work on a schedule of rates. They might have done so on the basis of Messrs. Lowther and Kidd's offer, taking little risk, and being paid a percentage on the gross cost. I therefore considered that the work could be done as well by local contractors on piece-work terms, working under the direction of our resident engineer and staff.

50. I went on tour to the State of Baroda to advise His Highness the Gaekwar on harbour works, returning to Bombay on the 21st December. On the 24th December, 1919, I had an interview with Sir George Lloyd at Government House, and discussed the purchase of the dredger, and it was decided to despatch a cablegram to my London office asking that tenders for the construction of the dredger be obtained from the various dredger builders. On the 6th January, 1920, I went on tour to Gwalior, and thence to Burma to advise on various schemes. On the 14th January, 1920, the following telegram was despatched to me to Burma :—

"Bombay Government decided to appoint your firm consulting engineers Back Bay Scheme subject to requisite sanctions of superior authorities and settlement of terms. Your private note regarding terms being considered officially. Understand you will now return Bombay after completing work in Burma. Please telegraph possible date of arrival."

The decision on which this message was based was as follows:—

> "That this Government decides to appoint Messrs. Meik and Buchanan as consulting engineers to the scheme, subject to the scheme being sanctioned by the Government of India and the Secretary of State, and subject to terms being settled with Sir George Buchanan."

51. I returned to Bombay on the 18th February, and on the 21st February, 1920, I had an interview with Sir George Lloyd, and discussed with him how the work could best be pushed forward, as he was very anxious to see a start made. I think it was at this meeting that I said to His Excellency that Colonel Grisewood had asked if he could see me, and I replied that I could not do so without His Excellency's approval. Sir George Lloyd replied that although Colonel Lowther had no legal claim on the work there was possibly a moral claim, and that all things being equal he would like him to be given a chance of getting a portion of the work.

52. It was the same day or the following morning that I saw Colonel Grisewood, who told me he was forming a construction syndicate, the capital of which would be obtained in India, and that although neither Sir John Norton-Griffiths or Colonel Lowther would be actively associated in the carrying out of the work they would receive a percentage of the profits. On the same date there was a Council Meeting to discuss the terms of my firm's appointment as consulting engineers.

53. On the 22nd February, 1920, I had an interview with Sir George Lloyd who informed me the Council had approved of our appointment and the terms of our engagement. We again discussed the plan of operations and I said that in view of the urgency of the work I advised the acceptance of Colonel Grisewood's offer to carry out the first section of the wall at Colaba, because it seemed the only way of making an immediate start and local capital would be employed as well as local men interested. I think that it was at this meeting that Sir George Lloyd told me of his scheme for a Bombay Development Department. He also told me that he had decided to offer Sir Lawless Hepper the post of Director of the Department and he asked me for my opinion of this appointment. This I gave to him. On the 26th February, 1920, I wrote a demi-official letter to Mr. Monie, who was then Secretary to the Government of Bombay, and said that with reference to our conversation I enclosed copy of my note in which he would see I recommended that Colonel Grisewood's firm should be given the contract for the first section of the wall and that I had come to that conclusion because it was my conviction that in no other way would it be possible to get a good start made by the end of the monsoon. By an arrangement with Colonel Grisewood we guaranteed a start and obtained time to breathe and think, and at the same time we only bound ourselves to the first section. I also said in the letter referred to that I had discussed the matter with Sir Lawless Hepper, who approved.

54. On the 28th February, 1920, I left Bombay for London taking with me a letter of introduction from Sir George Lloyd to Mr. Montagu, Secretary of State for India. The letter was from the Private Secretary to His Excellency, the Governor of Bombay, to the Private Secretary to Mr. Montagu, Secretary of State, and said that my firm had been appointed consulting engineers to the Government of Bombay for the Back Bay Reclamation Scheme and that His Excellency was anxious that I should be given an opportunity of discussing any details of the scheme which appeared to require explanation with the Secretary of State or other official deputed by him. I arrived in London on the 17th March and on the following day I wrote as follows to the Private Secretary to Mr. Montagu:—

> I beg to enclose a letter from the Private Secretary to His Excellency the Governor of Bombay and in pursuance of His Excellency's wishes I place my services at the disposal of the Secretary of State to explain any details connected with the Back Bay Reclamation scheme.
>
> I have had the advantage of discussing the subject fully with the Governor in Council, Bombay, the Government of India and personally with Sir George Lloyd, and if the scheme is sanctioned by the Secretary of State, His Excellency wishes no time to be lost in placing the order for the dredger as it is necessary for everything to be ready to begin the reclamation as soon as the first section of the wall is finished.
>
> In this connection a tender for the dredging plant, in accordance with the general specifications drawn up by my firm, was received from Messrs. William Simons & Co., Ltd., and, acting on Sir George Lloyd's personal instructions, my firm took in tenders from other builders, the result of which was communicated to the Governor in Council, when I recommended Messrs. Simons' tender be accepted, subject to my firm's approval of the detailed plans and specifications and to certain important modifications which appeared necessary to me after further consideration on the spot of the best means of carrying out the works.

Messrs. Simons' time for the acceptance of their tender expired on the 12th March and I understand that the Government of Bombay, or the Government of India, telegraphed to the Secretary of State to see whether Messrs. Simons & Co. would extend the period for a few days so as to give time to the Secretary of State to receive and consider the complete reclamation and housing scheme.

I was also informed that the complete scheme was despatched by the same mail that I travelled by from Bombay and I was desired to lose no time in communicating with you, as if the work is to proceed and the Secretary of State accepts the proposals of the Government of Bombay in respect to the execution and supervision of the work, it is desirable that my firm should further discuss details of construction of the dredging plant with Messrs. Simons & Co. at the earliest possible date.

55. I received a letter from Mr. Brown, the Private Secretary to the Secretary of State on the 23rd March, 1920, saying that the Secretary of State was at present away from the office on account of ill-health but that Sir John Steevens, Acting Director General of Stores at the India Office, would be pleased to see me and discuss the Back Bay Reclamation scheme; that he had been anxious to have an opportunity of going through the matter with me on my arrival from India, and would be glad to make an appointment with me if I would suggest a time. Accordingly, I met Sir John Steevens on the 25th March, 1920 and the result of my interview is given in the following extracts from a letter I wrote to Sir George Lloyd on the same date :—

On Thursday, the 18th inst., I sent the Private Secretary to the Secretary of State the letter given to me by Mr. Cowie, accompanied by one from myself, a copy of which I enclose.

I received a reply from Mr. Brown stating that the Secretary of State was still away from office on account of ill-health, but that Sir John Steevens, Acting Director General of Stores at the India Office, was anxious to see me, and I have to-day had a long interview with him.

In the first place, I may say that the India Office asked Messrs. Simons & Co. to extend the time of their tender for the dredger and they agreed to do so provided there is another material increase in their prices, and I was not far out when I told you that if the order was not placed before the 12th March it would cost your Government another £100,000.

After discussing the dredger proposition generally, Sir John Steevens informed me that the India Office had passed orders to the effect that no order for the dredger was to be placed until the whole scheme had been sanctioned but that he along with his experts, was to go into the question of the dredger and decide if Messrs. Simons & Co.'s offer was desirable both from the practical and financial points of view.

Sir John then told me plainly that his expert was Sir John Biles, the Consulting Naval Architect to the India Office, who, if the scheme was sanctioned would prepare the detailed specifications and superintend the construction of the vessel. I said I had already discussed this aspect of the situation with yourself, and that I understood you would be adverse to dual control in connection with the scheme because if the dredger did not do its work, we should turn round and say that as we had had nothing to do with the dredger we could accept no responsibility. I also pointed out that obviously the Engineer to the scheme must have a voice in the construction of the dredger, although Sir John Biles, as Naval Architect to the India Office, might reasonably be expected to see that the dredger was a properly built sea-going vessel and that there was a great deal of work in connection with pipe lines and land stations which would be dealt with by my firm. Finally, I said that the last thing any of us wanted was friction and that, speaking for my firm, we were perfectly willing to work jointly and amicably with Sir John Biles; that I could give him a great deal of my local knowledge on points essential to the successful working of the dredger whilst he on his side would no doubt be useful in discussing details of construction of the dredger itself, Sir John Steevens thought this was a perfectly fair arrangement and I hope the work will proceed on those lines.

I also explained to Sir John Steevens that as we have been appointed the Engineers to the Back Bay scheme we wished to get on with the working drawings of the wall and generally proceed with the arrangements for carrying out the work as soon as possible; he made a note of this and promised to let me know when anything was settled. Meanwhile, time is passing and I am afraid you will be very disappointed at the continued delay in getting the Secretary of State's sanction to the entire scheme and at this rate it will be almost impossible to have the dredger ready for work by the end of the 1921 monsoon.

56. On the 29th March, 1920, I received a cablegram from the engineer of the Grisewood Syndicate saying the contract for the first section Back Bay had been concluded as recommended by me and that he would see me in London in the middle of May about the estimates.

57. On the 10th April, 1920, I received a letter from the Director-General of Stores saying that the approval of the Secretary of State in Council had been given to the taking of all steps necessary short of placing the contract. These steps involved the preparation of the necessary detailed plans and specifications, &c., for the provision of the dredger, pumping station, pipe lines, &c., in anticipation of full approval to the execution of the scheme being given at a later date. Further, I was informed that as a preliminary measure it would be desirable if I met Sir John Biles and Sir John Steevens, the Director-General of Stores, in order that a clear understanding might be arrived at, and any overlapping avoided. Accordingly, I met Sir John Steevens and Sir John Biles on the 16th April, and a discussion with these gentlemen led to the desired clear understanding.

58. On the 12th April, 1920, I met Colonel Claude Lowther, M.P., and Sir John Norton-Griffiths, M.P., who wished to discuss their position in relation to the Back Bay Scheme. On the 13th April, Sir John Norton-Griffiths wrote to me enclosing a copy of a cable sent by him on that date to Colonel Grisewood, also a copy of a letter his firm had addressed to the Secretary of State for India, in which they assumed that a contract for a portion of the Back Bay scheme had been given to them and asked that the contract should be signed in London between Norton-Griffiths & Co., Ltd., and the India Office. On the 15th April, 1920, Sir John Norton-Griffiths wrote to me and said that with a view to saving our staff unnecessary work he had had a draft made of the form of contract suggested, and he enclosed it for my information.

59. On the 20th April, 1920, at an interview at the India Office with Mr. Montagu, Secretary of State for India, I presented a memorandum of which the following are extracts, detailing the position of the Back Bay Scheme up-to-date :—

" The position when I left Bombay was as follows :—

> The scheme as prepared by myself had received the approval of both the Government of Bombay and the Government of India, and the Governor (Sir George Lloyd) had discussed with me the best methods of executing the work and had also explained his proposed organisation for carrying out not only the Back Bay Reclamation Scheme, but the whole of the Housing and Improvement Schemes. I was informed that a despatch had been issued by the Government of India to the Secretary of State asking sanction to the entire project, and that it was tolerably certain that sanction would have been received by the time I got to London.

" Sir George Lloyd was particularly insistent that the Back Bay Reclamation work must be started at the end of the monsoon, say about the month of October, 1920, and I left with the Governor a note explaining how this was to be done. I also recommended the appointment of a resident engineer, and time being an object, I proposed that a contract for the first section of the wall should be given to Colonel Grisewood's Syndicate, who were in a position to make a start with the preliminaries, and begin the permanent work directly after the monsoon.

" My instructions were to proceed home with all possible speed, and, on the assumption that the Secretary of State would have sanctioned the scheme by the time I got home, I was—

> (*a*) To make arrangements for the construction of the dredger and
> (*b*) To put in hand the necessary drawings and estimates for the construction of the wall

and I was given a letter to the Private Secretary to the Secretary of State saying that His Excellency was anxious that I should be given an opportunity of discussing any details of the scheme which appeared to require explanation, with the Secretary of State, or other official deputed by him. I forwarded this letter on my arrival in London on the 18th March, accompanied by a covering letter of my own explaining the urgency of the case, and I was informed by Mr. Brown that the Secretary of State was unfortunately ill, but that the Acting-Director-General of Stores (Sir John Steevens), was anxious to see me.

" I had a meeting with Sir John Stevens on the 25th March, and he informed me that orders had been passed that no contract for the dredger was to be placed until the whole scheme had been sanctioned, but that he, along with his expert, was to go into the question of the dredger, with special reference to the tender we had under consideration. I also discussed the relative responsibility of his expert and myself in regard to the work.

" On the 10th April, 1920, I received a letter from the Director-General of Stores observing that the approval of the Secretary of State in Council had been given that all steps, short of placing the contract, were to be taken in the preparation of the necessary detailed plans and specifications for the provision of the dredger, pumping station and pipe lines, in anticipation of full approval to the execution of the scheme being given at a later date, and, as a preliminary measure, it would be as well for Sir John Biles—Consulting Naval Architect—and myself, to meet Sir John Steevens.

" The same day I received a letter from Bombay from the Chief Engineer to Colonel Grisewood's Syndicate stating that a contract for the first section of the Back Bay Scheme had been given to his firm on the lines suggested by me, that he was leaving Bombay on the 14th April, and would, on arrival in England, come immediately to see me in order to discuss and settle the various details of the scheme. He also described a number of arrangements that had already been made in Bombay for the immediate execution of the work.

" On the 16th April I had a meeting at the India Office with Sir John Steevens and Sir John Biles, and came to a satisfactory understanding as to the relative responsibility of Sir John Biles and myself. I then informed Sir John Steevens of the letter I had received stating that a firm of Contractors had been given the contract for the first section of the wall, and I remarked that the most vital matter in connection with the whole scheme was to place the order for the dredger, as if this was not done promptly a whole year's time would be lost, all our plans being made on the assumption that the dredger (which would take a year to build) would arrive in Bombay in time to start operations at the end of the 1921 monsoon. The sanction to prepare detailed plans and estimates would be of very little use, as the builders would first and foremost have to order the steel, and this they could not do until the order for the dredger was placed. I also said that the position seemed a most curious one, as the construction of the wall, which would be of no use without the dredger, had apparently been arranged, while we were told the dredger could not be ordered. Sir John Steevens then said he would go and confer with some of the higher officials, and when he returned he informed me that the whole of the projects in connection with Bombay Improvements were now being discussed by the India Council from the financial point of view, and that he had been told it was not possible to detach the Back Bay Scheme from the complete project.

" The Government of Bombay in Council have appointed my firm the Engineers to the works in Bombay. As already stated, my instructions were to push ahead with the preparation of the detailed plans and estimate for the sea-wall so soon as the sanction of the Secretary of State had been received to the project.

" The Secretary of State has not yet sanctioned the project, but orders have been passed that detailed plans of the dredger may be prepared, even if an expenditure is incurred in connection therewith. On the other hand, the Bombay Government appear to have made all arrangements for constructing the wall, and possible of finding the money from their surplus balances, but as the project has not been sanctioned I have taken no action in the preparation of the detailed plans and estimates for the wall, although the Contractors' Engineer will, I understand, be home in a month to discuss the plans with me.

" It is perhaps a pity that the Back Bay Scheme is involved with so many other projects because taken by itself it must be exceedingly profitable to the Government."

60. The following is an extract from the memorandum of my interview, written on the 21st April, 1920 :—

" I called on Mr. Montagu by appointment at 3.20 p.m., and was received by him almost immediately.

" I said that I considered the subject on which I wished to see him was of sufficient importance to put down my views in writing, and that also I thought by so doing I should save his time. I asked him whether he would like me to read the paper or would he read it himself. Mr. Montagu said he would read my memorandum, which he did, asking me a few questions from time to time.

Mr. Montagu then took up the pen and red ink and wrote for some minutes at the back of my memorandum. He then said he would read me what he had written. To the best of my recollection the following was the substance of his remarks :—

" Sir George has given me a characteristically strongly worded memorandum which was for my private information, and to which under the circumstances I take no exception. Sir George Buchanan explained that

the project was being held up on account of the order not being placed for the dredger, and I direct that the papers be circulated and the case be brought up in Council for final decision on Tuesday next."

Mr. Montagu then talked to me rather freely. He said that he had discussed the Back Bay scheme with Sir George Lloyd, who was sitting in the chair I was then occupying, and he had impressed upon him the necessity of the work and the importance of its being done by Government.

Mr. Montagu said he was wholeheartedly in favour of the project, which had always been most attractive to him.

I then explained to him my position—namely, that after my scheme had been approved, Sir George Lloyd had asked me whether my firm would be the engineers as he did not wish the Bombay Public Works Department to have anything to do with the work. I had agreed on behalf of my firm and had promised to make the carrying out of the work my principal object, if necessary declining works elsewhere, and I had agreed to go out and spend several months every winter in Bombay.

I also said I should like to explain the position of Norton-Griffiths & Co., who I understood considered they had again been left out of the business. I said that Colonel Grisewood, who is at present in Bombay, was sent out by Colonel Claude Lowther as his representative with special reference to the Back Bay Scheme. Colonel Grisewood had asked if he could see me, and I had replied that I should first like to consult the Governor of Bombay. I saw Sir George Lloyd, who said he would like me to have a talk with Colonel Grisewood, as although Colonel Lowther, as the head of the defunct firm of Lowther & Kidd, had no legal claim on the work, yet there was possibly a moral claim on account of certain correspondence which had passed. I saw Colonel Grisewood, who informed me that he was forming a Construction Syndicate, the capital for which would be obtained in India, and that Sir John Norton-Griffiths and Colonel Claude Lowther would have nothing to do with the real operations, but would receive a certain percentage of the profits. He then gave me proposals for carrying out the first section of the work, and in view of the great urgency I recommended Sir George Lloyd to accept his offer as it seemed the only means of starting the work at once.

When I came home I met Sir John Norton-Griffiths and Colonel Lowther at dinner at the House of Commons. We discussed the Back Bay Scheme, and I told them what had happened; to my surprise they repudiated Colonel Grisewood.

I then said to Mr. Montagu that we really could not keep pace with these changes. We had turned down Mr. Kidd and given the work bona fide to Colonel Grisewood, and if there were now any differences between Norton-Griffiths & Co. and Colonel Grisewood they must settle them between themselves. Mr. Montagu agreed and said it was obviously nothing to do with us.

The meeting then terminated. Mr. Montagu informed me as I left that he hoped to give me news as soon as possible after Tuesday next."

61. I received a letter dated 5th May, 1920, from the Director-General of Stores saying that approval had been given by the Secretary of State for India in Council to proceed with the purchase of the dredger and accessories, and that action would now be taken accordingly.

62. On the 14th June, 1920, I had a meeting with Sir John Biles and Mr. West, from the India Office, and discussed with them the Back Bay dredger and plant. Together we went over the tender and specification for the dredger, discussed the question of the supply of electric current for the relay station, the manner in which the dredger was to be delivered at Bombay and the erection of the pontoons and pipe line at Bombay.

63. On the 18th June, 1920, I received a letter from the India Office forwarding copy of letter to Messrs. William Simons & Co. instructing them to proceed with the supply of the dredger for Back Bay. Work on the construction of the dredger and other plant then proceeded smoothly.

64. In concluding this summary of the history of the scheme from its inception I wish to record the opinion that there was no undue haste shown by anyone in proceeding with the work. For many years the project had been discussed and rediscussed and pending its disposal one way or the other it was blocking the development of Bombay. Once the scheme was sanctioned obviously the correct procedure was to get to work as soon as possible and Sir George Lloyd's (now Lord Lloyd) anxiety to see a beginning made at the end of the 1920 monsoon instead of losing

another whole year was reasonable. Although not being an engineer he did not realise the amount of preliminary work necessary in all large schemes before operations can actually be begun. Had the work been entrusted to the Bombay Public Works Department it would, I judge, have taken at least three years before anything was done, not on account of the unwillingness or inability of the engineers belonging to the Department but in order strictly to conform to procedure.

In the first place nothing would have been put in hand without the town planner's lay-out and then a complete working project estimate for every detail of the entire work would have been required by the Government of India before the expenditure of a rupee had been permitted on the work.

Our plan of operations was to prepare a general scheme and estimate and the detailed plans and estimates step by step as the work proceeded, a by no means unusual procedure. I said, and it has been proved correct, that the way prices of labour and materials were fluctuating in 1920 made the preparation of a complete project estimate a useless waste of time, unless indeed prices were included which could hardly under any circumstances be exceeded.

(3) *Execution of the Work.*

65. In the first place it will be convenient to discuss the duties and responsibilities of my firm under the agreement with the Secretary of State. I will then comment on the various estimates prepared for the project, and lastly discuss the execution of the work under sub-headings :—

Management and control.
Sea-wall.
Storm water drains.
Dredging.

Agreement between C. S. Meik & Buchanan and the Secretary of State for India.

66. There had been considerable discussion on the subject both in India and with the India Office in London and a draft agreement had been prepared. I had objected to a clause in this which provided that in the event of my death or incapacity the agreement might be determined; I said it was unusual inasmuch as my death or incapacity would not prevent my firm from carrying out and completing the work under the agreement in a satisfactory manner. I also said I was not aware of any other case where the execution of a work had been specially confined to the personal attention of one particular member of a firm. The clause referring to the determination of the agreement if I died or became incapacitated was deleted, but the one in respect to my personal attention to the work was retained. The agreement, as executed, appointed my firm as engineers to the Secretary of State, in carrying out the scheme described in my report dated September, 1919.

67. It was specified that the firm should at all times assist and advise the Government of Bombay in all matters relating to the execution of the work and perform all work and duties devolving upon engineers of large works. Work in England was specified, work in India and terms of payment. There was also a clause providing for arbitration in case any dispute arose between the Secretary of State or the Government of Bombay and the firm, as to the works and the duties of the firm. We have carried out the whole of the duties prescribed in the agreement so far as it was possible to do so, and certainly a great deal more than is usually performed by engineers in charge of large works. In this connection we desire to emphasise the fact that we were the Engineers, not the Contractors for the work, as we notice in the evidence a tendency to put us on the same footing as Messrs. Lowther & Kidd or Sir W. G. Armstrong Whitworth & Co., who are contractors. Sir Lawless Hepper, for instance, in his evidence stated that Meik & Buchanan carried out the work as agents for Government, which statement is untrue. Messrs. Lowther & Kidd and Armstrong & Co., offered to carry out the work as agents for Government but demanded a commission of 5 per cent. on the cost and an absolutely free hand as regards the execution.

68. It may be useful if I relate the usual recognised procedure in this country in regard to carrying out works at home or abroad and I do so in the light of over 50 years' professional experience by my firm, during which time they had carried out work of an aggregate value of many million pounds.

An engineer's duties to his clients consist, in the first place, in preparing plans, specifications and estimates of cost and if these are approved it is usual to invite tenders for the execution of the work. Apart from the work at Bombay, my firm has carried out to a successful completion two small projects on the departmental system, but we prefer working with a contractor. Under ordinary procedure, when the tender has been accepted, it is the duty of the contractor to make all arrangements for the execution of the

work, purchase plant, engage labour and design and make drawings for all temporary works and structures. The general arrangements are usually subject to the approval of the engineers who have to satisfy themselves that they are suitable for carrying out the work within a specified period, but otherwise the engineers are only concerned with the carrying out of the permanent work in accordance with their drawings and specifications.

69. To represent and assist the engineers there is appointed a resident engineer and staff of assistants, who are under the direct orders of the engineers. Their salaries are paid, in some cases, by the engineers and in others by their clients, depending upon the terms of the agreement, but there is no dual control and the duty of the resident engineer is to carry out the engineer's orders, to see that the work is executed in accordance with plans and specifications, and to measure up the work done from time to time in order that the engineers may issue certificates for payment of the Contractors. The resident engineer also sends the engineers progress reports, progress plans and sections and corresponds regularly with the engineers.

70. There are sometimes disputes between engineers and contractors and if the engineers think the contractors are not carrying out the works properly or with sufficient speed, there is generally a clause in the contract enabling them to take the work away from the contractors and to make other arrangements. There is also a clause in the contract giving the engineers power to order the removal from the works of an agent, engineer or other employee of the contractors who in their opinion shall be guilty of misconduct or be incompetent or indifferently qualified. In the case of work abroad a principal of the engineering firm usually makes a visit of inspection about once a year to satisfy himself that all is going on well and that the resident engineer is doing his duty, whilst in this country the engineers make more frequent visits. Remuneration almost inevitably takes the form of a percentage on the actual cost of the work, varying from 7 per cent. downwards, depending on the magnitude of the work and whether the resident engineer and staff is paid for by the engineers or their clients.

71. It must, however, be understood that the engineers although responsible to their clients for the proper execution of the works by the contractors in accordance with the terms of the contract, are not executive officers, and have nothing to do with the contractor's detailed arrangements for carrying out the work, the men he employs or the plant he uses, except that if the contractor is obviously using insufficient labour and plant to carry out the works within the time of the contract, or otherwise is not working according to specification, the engineers have powers to insist on the contractors taking measures to accelerate progress by putting on more men and machinery. In the case of the Back Bay Reclamation scheme, as I have already explained, the execution of the work was placed in the hands of the Development Department of the Government of Bombay, who, therefore, took the place of the contractors, the Director of Development represented the contractors' chief agent, and his engineers the contractors' staff. This is admitted by Sir Lawless Hepper in his evidence before the Committee. He agreed that Sir George Lloyd in his speech dated 3rd August, 1920, announced the intended formation of a body to be called the Development Directorate, and that their first duty was to carry out with the assistance of his engineering staff the Back Bay Reclamation scheme, and any other reclamation schemes which might be found necessary in or near Bombay City.

72. Sir Lawless Hepper stated that he was appointed Director on the 8th November, 1920, and on being asked whether he was assisted by two groups of gentlemen, secretaries and engineers, replied, " The Engineers were directly under me and I and the Engineers formed the Directorate, which is the executive part of the organisation to carry out the work." He was then asked to confirm the date of the appointment of the first Chief Engineer (Mr. Lewis) and his successors in office.

73. With regard to the position of my firm and myself I wish to make it clear that we never had any direct responsibility for the actual execution of the work. We were not executive officers, we had nothing to do with the employment of labour or rates of pay, the letting of the numerous contracts in Bombay, or the purchase of local stores and materials, nor were we consulted on those points. Detailed estimates for the execution of the work were submitted by the Chief Engineer direct to the Director of Development for sanction, and were not seen or dealt with at all by my firm. In the matter of the supply of machinery from this country, we were regarded as agents to carry out the orders of the Development Department, and although we did sometimes offer an opinion it was not incumbent on the Director to consult us.

74. In the matter of staff we nominated a resident engineer but in other cases we made enquiries at the request of the Development Department and as a rule advertisements were inserted in the papers by the High Commissioner who transmitted the applications to us and the selected candidates were interviewed by a Committee appointed by the High Commissioner and salaries, wages, and conditions of service were fixed by the Development Department. We had no power to remove any officers or workmen,

these powers being entirely in the hands of the Director of Development. This settles responsibility as nobody could be held to have executive powers, nor would any responsible person accept executive power unless he had control over all the staff and workmen engaged and it is absurd to suggest that this power was in our hands.

To summarise on the question of responsibility as between client, engineer and contractor.

When the client employs a contractor actually to execute the work:—

(*a*) The client approves the engineer's general proposals and is responsible for providing the necessary funds for the work.

(*b*) The engineer is responsible for the proper execution of the work by the contractor in accordance with the plans and specifications, but he has no responsibility or interest in the purchase of plant, employment of workmen or any other arrangements nor is he in any way concerned with cost accounting.

(*c*) The contractor is responsible for the cost of the work, making of the whole arrangements for the carrying out of the work, purchase of plant, employment of staff and workmen, etc., and in these details he does not consult the engineer. The keeping of cost accounts is of vital importance to the contractor.

When the client is his own contractor and at the same time the Government of a country, with definite rules of procedure the Government, who is the contractor, necessarily takes all responsibility for the carrying out of the work, employment of labour, purchase of plant, etc. The Government may delegate its powers to a Department, such as the Public Works Department or the Bombay Development Directorate, but final responsibility must rest with the Government. The engineer is responsible for the preparation of the detailed plans and estimates of the permanent work, and he must tender his advice to Government, but although the engineer may advise Government to keep proper accounts, to be economical in the use of plant and give his opinion on the execution of the work generally, he has no power to make Government take his advice, and, therefore, no responsibility.

75. The chief of the Executive is the Director of Development, and the responsibility for the execution and cost of the work rests entirely with him. We assisted and advised in every possible way but had no power to give orders, which would have been the case had the work been carried out by contract. At no stage were we informed in detail what the work was costing. We recommended Mr. Elgee for his appointment because he was a contractor's man, but when he had been at work for some time and I said to him, "What is the work costing, you are a contractor's man, where are your costing accounts?" he replied that under existing management it was quite impossible to get out costs and that the method of carrying out the work was far removed from anything in his experience, and the greater part of his time was occupied in the office writing up forms.

76. In the matter of my visits: I visited the work every year and once or twice in the year. After the usual procedure I inspected the works and expressed my opinion on the same. I announced my arrival to the Director of Development and the date of departure, and I was never asked to stay a day longer than I had contemplated, and Sir Lawless Hepper's statement to the contrary is untrue. Sir Lawless Hepper did, in January, 1923, suggest my firm should have an office and permanent representative in Bombay, and I pointed out that the resident engineer, whose official title had been changed to chief engineer, was supposed to be our representative, and that under our agreement the whole of the staff, both engineering and clerical employed in India in connection with the works, would be paid by the Government of Bombay. I said we welcomed the idea of having a resident engineer who would be our representative in fact, but his salary would be paid by the Government of Bombay and he would be senior to Mr. Lewis, who so far as the permanent works were concerned would have to obey his orders. He then said that in the matter of permanent works such as designs for the sewage mains and setting out of the development area it would be our duty to send out a man to make the surveys and to get together the information. This he had already mentioned to my firm in London when he was in England and we had at once agreed to the proposal.

77. The whole subject was then discussed at length by the Hon. Sir Chimanlal Setalvad, the member in charge of the Development Department, Sir Lawless Hepper and myself at a meeting at the Secretariat, Bombay, on the 4th January, 1923. The honourable member expressed the opinion that under our agreement we were to prepare working drawings, specifications, etc., for the whole of the work, and he asked why the Development Directorate were employing surveyors and draughtsmen for that purpose. I replied that our interpretation of the agreement was that we were to prepare drawings and specifications for the permanent works and for such plant and machinery as was ordered from England, but that the preparation of the drawings, etc., for all

temporary works were to be done by the Development Department as was usually the case when a contractor was employed, and that for these we took no responsibility. The honourable member dissented from my interpretation, and I then referred him to the clause in our agreement which stated that the whole of the staff, both engineering and clerical, employed in India in connection with the work would be paid by the Government of Bombay and pointed out the impossibility of our preparing in England drawings for temporary works. Finally an agreement was reached and the following is a copy of the official document approved by His Excellency the Governor in Council and my firm :—

" The Honourable Member, Sir Chimanlal H. Setalvad, Kt., with the Director of Development, Sir Lawless Hepper, Kt., met Sir George Buchanan at the Secretariat on the 4th January, 1923, when the following questions were discussed :

(*a*) Are Messrs. Meik & Buchanan to be appointed Engineers for the East Colaba scheme as well as for the Back Bay Reclamation Scheme?

(*b*) Are Messrs. Meik & Buchanan to be regarded as the Engineers for the Back Bay *Reclamation* only, or are they also to be the Engineers for the subsequent Development of the reclaimed area? and

(*c*) The relationship between Messrs. Meik & Buchanan on the one side and Government and the Chief Engineer, Reclamation Branch, on the other.

(2) After discussion the Honourable Member agreed to the following recommendations, which, it was understood, Sir George Buchanan was prepared to accept :

(*a*) Messrs. Meik & Buchanan should be appointed Engineers for the East Colaba Reclamation at a remuneration of one per cent. on the cost of the work, exclusive of the cost of land.

(*b*) Messrs. Meik & Buchanan are the engineers for the *Reclamation* and connected works only, and not for roads, drains, lighting and other things necessary for the development of the reclaimed area, but the cost of so much of the storm water drainage system as has to be constructed during the progress of the Reclamation is to be included in the amount on which the percentage for the purposes of the firm's remuneration is calculated. This recommendation applies also to the East Colaba Reclamation.

(*c*) The obligation which Clause 1 (*a*) of the agreement lays on the Engineers to carry out certain work in London may, with a view to securing a workable arrangement, be held to be confined to the *permanent* works only of the Reclamation, including storm water drains referred to in (*b*). And in order to ensure better co-ordination, all correspondence between the Engineers and the Chief Engineer, Reclamation Branch, should in future be addressed through the Director of Development, a copy of each document being forwarded at the same time for record in the Director's Office."

78. I will now summarise briefly the work performed by my firm and myself.

Work in England.

The dredger was a joint responsibility between Sir John Biles and my firm, otherwise we prepared the plans and specifications for the whole of the permanent works except in cases where the work was prepared by the Chief Engineer without our knowledge or consent. We also prepared a design for the gantry along the line of the sea wall. We prepared specifications (plans where necessary) and invited tenders which were sent to the India Stores Department, for necessary action, for plant and machinery aggregating in value approximately £350,000, exclusive of cost of dredger and practically the whole of these orders were placed in the United Kingdom.

79. In 1922 we received by a letter dated the 21st April, 1922, orders from the Director of Development that tenders for plant should be invited in countries other than the United Kingdom, and we cabled on the 11th May, 1922, as follows :—

" Referring to letter from Sir Lawless Hepper, dated 21st April, rolling stock orders already placed at most favourable prices and tenders under consideration for other plant. Serious delay inevitable if we are at this stage to commence making inquiries abroad. India Office have already discussed it with us and have approved our action. Do you confirm. Telegraph your wishes."

80. We employed and paid inspectors, and we furnished the India Stores Department with certificates on which the various contractors were paid. The Chief Engineer in a letter dated 5th October, 1921, said :—

> " Monie mentioned to me that he was going to propose that all the Development stores and machinery should be obtained through you. They evidently appreciate the way the stuff is watched and delivery kept in view."

We employed a permanent staff in our office whose time was chiefly devoted to the Back Bay Reclamation Scheme. The files of correspondence can be shown as evidence. The principals of the firm, and I in particular, devoted a great deal of our time to the work and other remunerative work was refused or curtailed because of my obligations to visit Bombay. For the purchase of machinery and stores in this country the usual charge in fees is 2½ per cent. on the cost. We agreed to perform the work for 2 per cent., and we have only been paid 1½ per cent., which in many cases has not paid our expenses. For the dredger we were to receive 1 per cent., and have only been paid ¾ per cent. I give these facts and figures because statements have been made as to remuneration to my firm on the supposition that it was all profit, and that we had no expenses.

Work in India.

81. I visited Bombay once each year, and twice in 1923, and if my visits were not as profitable to Government as they might have been, it was certainly not my fault as will be seen later on in this statement. On each occasion I wrote a long report to the Director of Development detailing the results of my inspection and gave it to him before I left Bombay, and it may be taken as tolerably certain that everything in the report had already been discussed verbally with Sir Lawless Hepper, and where possible, with the Chief Engineer. A partner (Mr. W. T. Halcrow, M.Inst.C.E.), who is specially qualified to criticise the execution of works, visited Bombay in 1922 and made a thorough inspection of the works, and in 1925 we sent our chief assistant, Mr. Settle, an enginner of great experience, to report on the dredging. These visits were outside the terms of our agreement and at the firm's expense.

82. I visited Bombay last on the 24th October, 1924, and I left Bombay on the 7th January, 1925, for Australia, with the full knowledge of His Excellency the Governor (who discussed Australia with me), Mr. Cowesjie Jehangir, the member of Council in charge of Development, and Sir Lawless Hepper. I intended returning to Bombay the following October, but was overtaken with an illness so severe that I was ordered by my Medical Adviser to go direct to England, as if I broke my journey at Colombo and went to Bombay he considered my life would be endangered. I arrived in London in a state of collapse, and sent a medical certificate to Bombay. The Bombay Government thereupon purported to cancel my agreement with the Secretary of State. My Medical Adviser is prepared to give evidence before the Committee on this point.

Estimates.

83. I will now give details of the various estimates prepared for the work, viz. :—my estimate of September, 1919, the Chief Engineer's revised estimate of 1921, my revised estimate of 1922, the Development Directorate's estimate dated October, 1922, and the estimate of the Advisory Committee, dated 1925.

Estimate of September, 1919.—This estimate was for 367·61 lakhs, increased by Government to 400 lakhs. It was at the time a fair and reliable estimate, and was accepted as such by the Government of India who examined the figures in the Public Works Department Secretariat and also by the Secretary of State who sanctioned the project. The estimate was not as stated by one of the members of the Committee " based entirely upon an engineer's report prepared in 1912 which was not checked in any way but taken over holus bolus." The estimate was most carefully prepared from data obtained from the Public Works Department, the Port Trust, the detailed information in my possession as to the cost of the Rangoon River Training works and the mass of information in the possession of the late Mr. C. S. Meik on cost of work carried out by his firm. In the matter of the dredging plant, estimates in detail were considered. The Government had in 1919 obtained a firm offer for the plant for £451,000 and the cost of dredging we worked out at 5·91 annas per cubic yard and we allowed 8 annas which gave a surplus for contingencies of over 32 lakhs of rupees. Sir Lawless Hepper's statement that insufficient provision had been made by Sir George Buchanan for the cost of the subsequent development of the reclaimed area in the way of roads, storm water drainage, sewerage, lighting, etc., is disingenuous—Sir Lawless Hepper was aware when he made that statement that in 1919 no reliable estimate was possible, as the Government had not even considered how the reclaimed land was to be utilised, and it was not until March, 1922, we received a copy of the preliminary lay-out prepared by the Town Planner, Mr. Davidge. Mr. Kidd on Public

Works Department's figures had allowed a lump sum of 59·45 lakhs which I raised to 75 lakhs. This included storm water drains, the continuation of the existing town roads across the reclaimed area: sewerage, it was understood, would be done by the municipality.

84. Prices were fluctuating, but no one in 1919 could foresee the vast rise in prices all over the world which would take place the following year, nor could he forecast that the Indian rupee would depreciate at the same time from 12 rupees to 15 rupees to the pound.

It is common knowledge that all engineers' estimates for works in various parts of the world had at that time to be increased by amounts varying from 50 per cent. to 100 per cent., and the Committee can by enquiry satisfy themselves on that point. To give one instance, when the dredger was ordered, the firm offer of £451,000 had been withdrawn by the lapse of time, and other circumstances combined to raise the contract price to over £650,000, payable at 15 rupees to the pound instead of 12. The Government were aware of this state of affairs, and could have called a halt, and asked for a re-examination of the estimate before the dredger was ordered had they wished to do so, but presumably the scheme was looked upon as so urgent and so profitable that a few hundred thousand pounds divided into 1,140 acres of land was a comparatively negligible factor, and I had not then nor have I now any doubt as to the scheme's practicability from an engineering point of view.

The Chief Engineer's Revised Estimate of 1921.

85. On the 18th July, 1921, I wrote to Sir Lawless Hepper, and said that on my arrival in India in November, 1921, I should like to go into the matter of revised estimates for the Back Bay scheme, as there was no doubt that since my estimate of September, 1919, prices had gone up by leaps and bounds in India, especially in labour rates, but that I thought there would be a reaction, the general opinion in England being that within a measurable time it would be possible to carry out all civil engineering works at 50 per cent. over pre-war prices. In August, 1921, we were astonished to receive from the chief engineer revised estimates for the Back Bay scheme amounting to 7 crores of rupees, and on the 9th August we sent him the following cablegram :—

> " Please inform director we deprecate acceptance of your estimates either of cost or time of completion, and are seriously concerned at the same. We consider any revised estimates at this stage quite impracticable. In six months partial and in two years complete revised estimates possible. Your figure moorum seems most excessive in view of latest proposals, and we see no reason seriously to depart from our figures for dredging. Cost of stone depends upon total quantity used on all works of department, and cannot be ascertained for number of years. Letters to director and yourself follow."

On the same date we wrote to the chief engineer, and said that whilst we realised his difficult position in being asked for revised estimates at 24 hours' notice we thought it manifestly wrong to treat those estimates as official, as it was little short of lunacy to try and prepare estimates at this stage. We received in reply to our cablegram a letter from the chief engineer, dated 19th August, 1921, saying that the estimates were required for political purposes, and were given by him on the understanding that they were not binding, and he had also stipulated that they should not be published. Further, it was necessary to have an estimate which erred on the high side.

86. On the 9th August, I wrote to Sir Lawless Hepper and said we were seriously concerned at the revised estimates received unofficially from the Chief Engineer, and we thought the whole scheme might be gravely prejudiced by the preparation of revised estimates at this stage. Sir Lawless Hepper replied, dated 31st August, that he did not think we need be seriously concerned about the rough revised estimates. There was so much criticism and such an insistent demand for information as to the probable cost of the reclamation that Government felt it was necessary to give a general idea without details.

My Revised Estimate of 1922.

87. Shortly after my arrival in Bombay in 1921, I wrote to the Chief Engineer dated 18th December, 1921, in the following terms :—

> " The original estimate prepared by me in 1919, amounted to 367.61 lakhs of rupees and in sanctioning the project the Government of India increased the amount to 4 crores of rupees.
>
> I recommended that the whole work of constructing the wall should be let by contract if a suitable tender were received, but the general conditions following the war were such that a contract on pre-war lines was found to be impracticable

and the work is now being carried out departmentally under your immediate charge and direction.

All prices of material and labour advanced rapidly between the date of my original estimate and the date the work was finally sanctioned and put in hand, a complete revision of my estimate is therefore required.

Mr. Meik and I have discussed the matter fully and we are of opinion that although at this stage of the proceedings a final estimate is impracticable, it is nevertheless possible and highly desirable to substitute a more up-to-date estimate for that prepared in 1919, more especially as a great deal of preliminary work has been completed and practically all the machinery and plant has arrived.

We do not propose to give any more detail in the revised estimate than in the original one, but in order to arrive at the total quantity of the various items and the prices to be placed against each it will be necessary to examine the detailed cost of the work completed and in hand, and we shall be very glad if you will assist us in obtaining the necessary information. I have in the accompanying notes indicated broadly what seems necessary. Perhaps you will kindly look through them preparatory to a discussion with me on the whole subject.

In connection with the report I am making to Government on the progress of the works, will you be good enough to furnish me with a complete schedule of establishments and salaries as on a work of this nature I hold strongly the opinion that supervision, and especially skilled engineering supervision, should be ample both as regards quantity and quality."

88. From information thus supplied I prepared a revised estimate amounting to 668,98 lakhs gross and 598,89 lakhs net after allowing for recoveries for value of machinery and plant. This estimaate accompanied my report dated 11th February, 1922, and Sir Lawless Hepper has in his evidence made statements in this connection which are so misleading as to amount to untruths.

Development Directorate's Estimate of 1922.

89. I was of course aware that the Chief Engineer was preparing his detailed project estimate in accordance with the ordinary Public Works Department procedure, but that was apart from our estimate as engineers for the works, and on the 4th July, 1922, the Director of Development forwarded us a printed copy of the complete project estimate prepared by his Chief Engineer and intimating that it was being submitted to Government for sanction but that Government would be glad to have any criticism we desired to make. We replied on the 26th July, 1922, and refused to accept the estimate which, we stated, was excessive, requiring careful examination and a great deal more information before it could be passed. We also remarked that in our opinion the estimate should not have been submitted to Government prior to our criticism. No action was taken by the Director of Development regarding our protest, and the project estimate was in due course formally sanctioned by Government and became the recognised working estimate, whilst the date for beginning dredging operations was postponed to 1924-25, and the completion of the whole scheme to 1931. It was not our estimate; we considered it extravagant and it has never had our approval. Incidentally I may point out that in the report accompanying the estimate and in the estimate itself, my firm were styled the "Consulting Engineers."

90. Sir Lawless Hepper in Appendix A of his statement has given a comparison between the cost of the works as provided in the sanctioned project prepared by his Chief Engineer and his new estimate, and in his evidence he points out that there is a saving on the estimates other than those connected with dredging amounting to some 35 lakhs of rupees. In point of fact, this absolutely proves our case that the estimate was an excessive one, because, notwithstanding the extravagance of the Development Directorate in the execution of the work, a saving has been shown, but that saving, it might be pointed out, is largely because of my action in cutting down expenditure on the permanent wall and cross walls.

In the above connection I would point out that nothing is easier than to over-estimate the cost of a work and thereafter take credit for savings, but the word savings is a misnomer.

Estimate of Advisory Committee, 1925.

91. Lastly, I come to the estimate accepted by the Special Committee appointed by the Government of Bombay in January, 1925, to inquire into the activities of the Development Department, the chairman of the Committee being Sir Lawless Hepper, the Director of the Development Department. The Special Committee appointed a sub-committee, also under the chairmanship of Sir Lawless Hepper, to examine in detail the financial prospects of the Back Bay Reclamation Scheme. This Sub-Committee

took as a basis the figures for dredging in 1923-24, 1924-25, and observed in their report, " On this basis the Chief Engineer now estimates the cost of the whole scheme at 11 crores and the date of completion 1944-45." In effect the filling *will take* four times as long and cost about four times as much as it would have done if Sir George Buchanan's estimate of output had been attained. The Special Committee accepted these figures, and when their report, dated 1st January, 1926, was published to the world, my name was coupled with it as an example of engineering inefficiency, and in a letter to the Secretary of State for India dated 12th February, 1926, my firm expressed surprise at the publication of the report, and said, " We most emphatically decline to accept the reported conclusion of the Committee as to cost and time of the completion of the work."

92. I will now quote from the evidence given by Sir Lawless Hepper, the Director of Development, and Mr. Elgee, the Chief Engineer, as it appears in the report of the proceedings of your Committee.

Sir Lawless Hepper, 4th August, 1926.

Q.—A sub-committee's report mentioned another estimate for 11 crores. Where does that come in?

A.—That is an estimate prepared for the sub-committee. It is an approximate estimate only, prepared by the chief engineer in July, 1925, to show what the probable cost of completing the reclamation would be, assuming that the results of dredging would be no better than they were in the season 1924-25.

Mr. Elgee.

Q.—In the Director of Development's notes, he gives a total estimate of 9,27 lakhs in his advance statement. I cannot reconcile these figures. Can you explain to me the difference between that and your estimate of 11,00 lakhs?

A.—The 11 crores estimate was based on the season's dredging of 1924-25, as they were the only figures we had to go upon. We were ordered to prepare an estimate on that basis. The whole of the work must be carried under that 11 crores estimate.

Q.—Is this 927 lakhs a revision of the 11 crores estimate?

A.—Yes, that would be a revision.

Q.—What is this based on? Why is it so much less?

A.—The difference is 2 crores, i.e., 1½ millions sterling.

Q.—One gets nauseate with these figures. You are putting Government in an awkward position. One month you are giving the cost as 9,27 lakhs; shortly afterwards you are giving the cost as 11 crores?

A.—It was all based on certain figures.

Q.—Then it is not the Engineers' estimate?

A.—It is not. It was on a very pessimistic view, it was based on the season's dredging which we knew could be improved. I do not call that an estimate (the 11 crores) although we had to put up that figure.

Q.—Who wanted it to be put up?

A.—That was prepared by the Advisory Committee.

Comment on this evidence is unnecessary.

Management and Control.

93. The work is being carried out by the Bombay Development Department and Sir Lawless Hepper, the Director of Development, is the executive head of the department. He is assisted by a staff of engineers and my firm had the nomination of the resident engineer, who would supply such information as was required and supervise the permanent work.

The position is aptly described in a pamphlet on the Development of Bombay written on behalf of the Development Department by Mr. St. Nihal Singh and to whom it is stated every facility was given by the Department.

" So that the work would be pushed through at the maximum speed, the Government created an independent department, known as the Development Directorate, to take in hand new projects. An engineer with long experience of railway administration (Sir Lawless Hepper) was placed at its head, and with him was associated a civilian of remarkable financial ability (Mr. P. W. Monie). Men who had made their mark in various branches of engineering were appointed to the various posts. A well-known British firm of engineers (Messrs. Meik & Buchanan) was retained to offer advice in regard to the reclamation work. A

distinguished British town planner (Mr. W. R. Davidge) was engaged to advise the Directorate on the remodelling of the old areas and the laying out of the new settlements. Government thus provided an efficient executive agency, in the Development Directorate, to carry out the work; whilst the control of Government over its operations was secured by attaching the Directorate to a regular Department of Government, known as the Development Department, under the Honourable Sir Chimanlal Setalvad, Member of the Executive Council; the Deputy Director of Development being also Secretary of Government in the Development Department."

94. Sir Lawless Hepper was officially appointed on November 8th, 1920, but previous to that date he had taken an interest in the work and assumed responsibility. In February, 1920, he was consulted and agreed to the proposal that Colonel Grisewood's syndicate should be given a contract for the first section of the wall. In August, 1920, he had attended conferences in our London office and agreed to the proposed programme of operations. When the works were begun nothing was done without his knowledge and consent. He sanctioned estimates prepared by his engineers and arranged contracts for the supply of cement and other materials. He scrutinised schedules of establishment and accepted tenders for works which were not within the powers of his own chief engineer. The Director was assisted by a Secretary to Government and a financial adviser, but so far as we were concerned, we regarded the Director of Development as the head of the department and we corresponded with him as such. There was an Advisory Committee of representative public men in Bombay, appointed by Government from whom the Director could obtain advice if necessary, but I was never asked to attend a meeting of the Advisory Committee and I think I only saw them on one occasion, the 16th February, 1922, and then I was not introduced to the members. I am not sufficiently acquainted with the working of the Director's office to say to what extent he was hampered by having to refer to the Member of Council in charge of the Development Directorate, but, from my general knowledge of Indian procedure, I should say that his difficulties must have been considerable. Certainly my own interviews with the hon. members in charge of the Department did not inspire me with confidence.

95. The Director had also to keep an eye on the political barometer as the work was being carried out under the shadow of an intense general and political hostility. Both the Director and the Chief Engineer frequently commented to me both verbally and in writing on the persistent hostile criticism that the scheme had received from its inception. This hostility extended to my firm. When I was staying with Sir George Lloyd at Ganeshkind on the 31st August, 1923, he told me that there were, I think, four different resolutions tabled in the Legislative Council giving alternative proposals to abolish us or reduce our fees. On the 1st August, 1923, Sir Lawless Hepper discussed the same subject with me.

96. An important matter we had to consider if the work was to start at an early date was to find a competent engineer, and good men at that time were exceedingly scarce. I had recommended in my memorandum dated 3rd December, 1919, the appointment of an officer who had served under me as my executive engineer on the Rangoon River training works, who had accepted a tentative offer in January, 1920. At the last moment, however, he decided to remain in Rangoon. In view of the urgent demand that the work should at once be put in hand this considerably upset my plans, but I finally decided to offer the appointment to Mr. L. W. Lewis, a chief engineer in the Indian Public Works Department, at that time stationed in Burma, and who had served under me both in Rangoon and Mesopotamia. I considered I was very fortunate in obtaining Mr. Lewis' services, and I wish to testify to the most excellent work performed by him up to the time his health broke down. He had the entire organisation and control of a very large quarry in connection with the Rangoon River training work and therefore knew exactly what plant to order for the quarry at Bombay and all contingent arrangements for housing workmen, &c. Mr. Lewis was appointed in June, 1920, and it was decided that after inspecting the works, and particularly after deciding on a site for the quarry, he should come home and prepare schedules of the plant he required to be purchased and despatched to India. Mr. Lewis arrived in London towards the end of July, 1920, and Sir Lawless Hepper, Mr. Lewis and ourselves had a long conference in the month of August on general matters connected with the scheme. Accommodation was given to Mr. Lewis in our office. We helped him with our advice but he was free to make his own detailed programme.

97. On the 25th August, 1920, I left for Bombay via East Africa and Mr. Lewis remained in our office getting the direct assistance of the late Mr. C. S. Meik in everything connected with the ordering of plant. On the 16th November, 1920, Mr. Meik wrote to me in Bombay as follows:—

"As no doubt Lewis has told you, he has now got the orders placed for practically the whole of the machinery, including the cranes.

"In the matter of the cranes, I have been into the whole question with Lewis and we have come to the conclusion that it would be better to defer ordering the cranes to deal with the concrete blocks until it is ascertained whether or not we are going to get really sufficiently large stone from the quarry to protect the sea face. I enclose you a memorandum that Lewis has handed me in this connection and with which I cordially agree. There is no doubt that if we can get stone of large enough size from the quarry it will mean the saving of a great deal of money."

98. In December, 1920, Sir Lawless Hepper, Mr. Lewis and I met in Bombay. In the same month the Development Directorate came into being. I do not know at what particular date the resident engineer became chief engineer for all schemes of reclamation, including those for which we were not the engineers, but we were not satisfied with the change, nor did I think the headquarters of the Development Directorate in the old Customs House should have been the office of the Chief Engineer, Back Bay Reclamation Scheme, and a number of his staff. I expressed my views to Sir Lawless Hepper on this point. I considered that Mr. Lewis was thereby detached from the work and I held that his office should have been in a central position on the site of the works. Presumably he was placed in the head office so as to be near his chief, the Director of Development.

Accounts.

99. I was very disturbed to find on my visit to Bombay at the end of 1921 that no cost accounts were being kept and that no one knew in any detail what the work was costing. Accordingly, I addressed the Chief Engineer on the subject, and on the 21st January, 1922, received the following reply :—

"*Ref. your letter dated the 7th instant.*

"I forward herewith in original the Audit Officers' letter No. $\frac{\text{W-40}}{336}$ dated the 17th instant, together with the statement referred to for information.

"May this statement be returned to this office when finished with."

"No. $\frac{\text{W-40}}{336}$

"With reference to your No. 4946 dated the 12th instant, I have the honour to forward herewith a statement showing the total expenditure to the end of October, 1921, on works, establishment, &c., on several sections of the Back Bay Reclamation Scheme :—

"Expenditure incurred on—

(1) Machinery obtained from home,
(2) Materials, and
(3) Labour charges,

is not available."

100. On the 22nd February, in my report to the Director of Development, I raised the whole question in the following terms :—

"*Engineering Accounts.*

In addition to an efficient engineering staff, the success from the point of view of economical execution of a work carried out departmentally depends upon the proper keeping of accounts.

As previously stated, the practice in India is to have a project estimate prepared by the engineers and sanctioned by competent authority before the work is put in hand, and this project estimate and subsequent works estimates are placed in the hands of the Government Accounts Department who, through their auditors, scrutinise all statements of expenditure submitted by the engineers and check each item against the sanctioned head of account, at the same time furnishing the engineers with debits of various kinds which may not have reached them at first hand.

An engineer is not thereby absolved from the responsibility for his accounts, but the check acts as a safeguard because any irregularity or excess on a head or sub-head of the estimate should be brought promptly to his notice by the receipt of an objection statement.

The engineer's accountant although under his orders is appointed by the Accounts Department and much depends upon his qualifications.

A good accountant should be more than a mere recorder of figures. He should be able to assist the engineer by the analysis of costs under many sub-heads which do not necessarily appear in the project estimate.

34. The practice in England differs from that which obtains in India. Works are sanctioned on estimates to which in India only administrative sanction would be given but whether the works are executed by contract or departmentally the engineer has to be in close touch with costs from day to day from beginning to completion of the works and by means of a competent accounts staff and a reliable system of cost keeping as differentiated from account keeping the engineer knows exactly where there has been excess on the smallest sub-head of his estimate or where money has been saved.

Both Indian and English systems have their good points and that in India is the result of many years' experience. I have worked with both and venture to suggest that a weak point in the Indian method is that works accountants are frequently not more than figure-recording clerks and when as a member of the Indian Munitions Board I was in control of the Indian Ordnance Factories, we entirely reorganised the accounts system, with the co-operation of the Accounts Department and in each factory accountants receiving perhaps Rs. 100 to Rs. 150 per month were replaced by Indian accountants of much more experience and receiving three and four times the pay who were capable of assisting superintendents in practical cost analysis.

35. My excuse for writing at length on this subject, apart from its general importance, is that the accounts of the Back Bay Scheme do not appear to be kept on either one or the other of the systems, described above. Although works estimates have been made, there is as yet no sanctioned project estimate. The chief engineer keeps no accounts nor has he been furnished with up-to-date statements of expenditure by the accounts branch in order that he may see how matters stand. In this connection I wrote to the chief engineer on the 7th January, asking to be supplied for the purpose of this report with a statement in some detail giving the total expenditure on the project up-to-date or reasonably so, the chief engineer asked the Accounts Department for the information and on the 21st January I received a statement of expenditure up to the end of October which can hardly be called up-to-date nor did it contain sufficient detail to be of any practical use.

36. The accounts are kept on what is known as the pre-audit system which means, as the name conveys, that no payments are made until the accounts have been audited and one of the chief recommendations for the system is that the audited accounts are supposed to be always written up-to-date.

Under such a system there is no object in the chief engineer keeping account books but it is of the first importance that he should be furnished at least once a month with an up-to-date statement of expenditure on all heads of account whilst each deputy chief engineer should be able to rely upon a current audit and the prompt supply of all debits against his estimates."

101. This was followed up by a letter from my firm dated 13th April, 1922, to the Director of Development, in which they said they desired to endorse and emphasise my remarks as it was impossible to exercise economy without a proper system of cost accounting. In a letter dated the 15th March, 1922, the Director of Development acknowledged receipt of my report dated 11th February, and said the various questions would be taken up with the chief engineer and in a letter dated 12th May, 1922, Sir Lawless Hepper observed :—

" The remarks about accounts, and also about additional engineering staff, in your report, were referred to Lewis immediately, and he was asked to consider them and to submit any recommendations he had to make. So far he has produced nothing, but he promises to let me hear before he leaves."

Subsequently the chief engineer reported in terms as under :—

" (7) With reference to paras. 33-36. I agree that the Audit as at present worked does not give us the information necessary for an economical control of the work from day to day. I had arranged with Mr. Bailey that I should be supplied with a statement monthly showing expenditure under the various accounts heads up to the end of the previous month.

For a long time the last account rendered remained that of the 31st October. Lately I pointed this out to Mr. Bean personally and I have since received statement for November and December, 1921. I am, therefore, without information as to expenditure during four months of this year.

(8) The deputy chief engineers find similar difficulties and it is not easy for them to know how they stand. I am informed that the audit department frequently ask the deputy chief engineers how accounts stand, which should be unnecessary. The system is apparently good enough for the audit but it does not give the deputy chief engineers information as to how costs are working out."

No action was taken by the Development Department until the 30th August, 1922, when a letter was addressed to the Government of India in the Financial Department suggesting that when I next arrived in India a senior officer of the Accounts and Audit Department should be deputed to investigate the matter on the spot in consultation with the Development Directorate, myself, and the Audit Officer, Bombay Development scheme.

102. On the 3rd October, 1922, the Government of India in the Finance Department replied sanctioning the proposal and in January, 1923, exactly a year after I had first raised the question, an officer arrived in Bombay for the investigation. In due course this officer wrote a report. He said that he had interviewed Sir Lawless Hepper, Sir George Buchanan, the Secretary to Government in the Development Department and the Chief Engineer, Mr. Lewis. He had been requested to look into the system of accounts and to report whether, without introducing an entirely new system, any modifications could be made showing analysis in greater detail, and so evolve a system of costing of the various processes. He pointed out that the present system of accounting was that in use in the Public Works Department. The sections sent in their bills properly allocated and the Audit Office watched the expenditure against the grant and estimate. A costing system would only be of use to the Executive and of no use to the Audit Office and he suggested that the present audit system remain unaltered but that a system be introduced which would be of the greatest use to the Deputy Chief Engineers in charge as it would be of a technical nature and would enable the Deputy Chief Engineers to watch expenditure over each process and to effect economy. I do not know precisely what happened as a result of this report. I think that accounts officers were sanctioned and afterwards removed, but the net result so far as I am aware has been that at no time has there ever been a reliable system of cost accounting such as any contractor or business man would insist upon as a matter of course unless he wanted to go bankrupt.

103. The incident has more than local interest. I have always entertained the idea that a weak point in the execution of Public Works all over India is the absence of a cost accounting system. At present, as was pointed out by the Public Works accountant, all that the Audit Office requires is correct allocation of bills and expenditure on every head within the sanctioned estimate. That the estimate may be far too high and that great savings could be effected by an attention to cost accounting does not concern the Audit Department and does not under the system concern the Engineer. The Chief Engineer for all reclamation schemes was under the direct orders of the Director of Development but so far as the Back Bay Reclamation Scheme was concerned he also had duties to my firm. As the man on the spot carrying out the work under the Director of Development he had a free hand, subject to the control of the Director, in all matters connected with the actual execution of the work. We had no authority to interfere with his discretion but in the words of our agreement we were at all times to assist and advise the Government of Bombay in all matters relating to the execution of the work, and the Director was at liberty to accept or reject our advice. On the other hand as regards the permanent work we desired full information as to progress and cost and we desired also progress plans, surveys and reports, which the chief engineer in his capacity of resident engineer was to supply.

104. Some time in 1921 the health of Mr. Lewis showed signs of giving way. He was laid up for three weeks in June, 1921, and on the 11th August, 1921, Sir Lawless Hepper wrote that he had been away for ten days as he was not very fit. As time went on we began to get very anxious indeed about the work. We were getting no information of any kind from Bombay and it appeared to us that the job was going to pieces and we felt we were being pushed out of our position as engineers to the work, and were regarded as people whose opinion would be asked if and when the Director and his engineers thought fit to do so. On the 11th April, 1922, I wrote to Sir Lawless Hepper and said, "I am much distressed to receive a letter from Lewis by this mail written from St. George's Hospital and I wonder if you are taking any action on the lines I suggested to His Excellency and to yourself. Possibly as his leave is nearly due you are letting him carry on to that date especially as it would be difficult for him to get a steamer passage by an earlier boat. On the other hand if you had Lewis examined by a Medical Board before he leaves India and they reported unfavourably he would not be able to return to India from leave without a clean bill of health. We feel very strongly that in the interests of the work there should be no chance of a repetition of this disastrous year of sickness."

105. Early in April, 1922, in a letter to the chief engineer we challenged an indent for a quantity of machinery and rolling stock aggregating in value over £90,000. We said we fully understood that as the work was being done without a contractor great weight must be attached to the wishes of the engineer on the spot in the matter of plant and plans for execution, and we had no desire in any way to hamper him. On the other hand it should be remembered that in addition to the actual capital cost of

the plant, interest for many years had to be paid, and it was desirable to economise, wherever it was possible to do so, without interfering with efficiency or with speedy execution. On the 11th April, 1922, I wrote to Sir Lawless Hepper on the same subject and concluded my letter by remarking we had pointed out that we had no wish to interfere with the discretion of the men on the spot or in any way to delay the work, but that in the interests of economy we thought his estimate might be cut down. In a letter dated 12th May, 1922, Sir Lawless Hepper replied, " I went through the question about rolling stock, etc., with Lewis and the result was the cablegram he sent you. With the exception of the portal crane for Colaba it seemed to me to be advisable to order the plant."

106. The plant was then ordered, the responsibility resting with the Director of Development. In this connection I think that there is no doubt " Higher Control " in the Development Directorate were imbued with the idea that the Back Bay Reclamation Scheme was a potential gold mine as in July, 1923, Sir Lawless Hepper showed me a financial statement of the Back Bay Scheme which estimated that by the year 1938 all charges against the works would have been paid off and there would be a cash surplus of 370 lakhs of rupees. I wrote to my partner on the 26th July, 1923, and remarked that I could now understand why Sir Lawless Hepper was not worrying very much about plant, economy, etc.

107. On another occasion I pointed out that the wagons were not being fully loaded at the quarry, thus delaying the work and increasing the cost. I gave examples and pointed out that one 20 ton wagon contained one stone weighing one ton, i.e., the cost of transport of that one stone was 20 times in excess of the estimate.

108. On the 27th April, 1922, I wrote again to Sir Lawless Hepper and said, " We have had no news from Bombay since the 24th March, when Lewis wrote me a demi-official letter from St. George's Hospital and for all that I know he may still be there." On the 12th May, 1922, Sir Lawless Hepper wrote as follows :—" Your letters of 11th and 27th April, Lewis was in hospital for several weeks and has not been at all fit since he came out. In his present condition, he is not up to the job. He will go before a Medical Board before leaving and will, of course, have to be passed fit by the Medical Board at the India Office before he returns." In a letter dated 3rd June, 1922, I wrote to Sir Lawless Hepper as follows :—" There can be little doubt that Lewis' health has broken down seriously and in the opinion of Mr. Meik and myself you would do well to have him examined at home by a Medical Board for an expression of opinion as to his fitness to continue hard work in the East." I went on to say that we had observed that there appeared to be a tendency on the part of the Chief Engineer to keep us in the dark and use us merely as agents for the purchase of plant. On the same date we wrote an official letter to the Chief Engineer (enclosing a copy to Sir Lawless Hepper) and said, " a veil appears to have dropped between us, and since Sir George Buchanan left Bombay on the 25th February, we have practically had no news of any kind as to the progress of the works. We concluded our letter with the following remarks:—

> " Finally we would say that we fully appreciate the difficulties you are encountering in carrying out departmentally a work of such magnitude and we should be the last people to contemplate adding to those difficulties.
>
> We know that in the matter of details in connection with the execution of the works you are taking the place of the contractor, and as far as possible the man on the spot must be allowed to use his unfettered discretion. That need not, however, prevent your keeping us fully informed as to the progress and cost of the works and asking us to advise on all matters where you think you would be benefited thereby, because it is impossible to ignore the fact that under our agreement with the Secretary of State we are appointed the engineers in carrying out the scheme and in the construction and execution of all works connected therewith until their final completion, and we are specifically instructed to assist and advise the Government of Bombay in all matters relating to the execution of the works and to perform all works and duties devolving upon engineers of large works."

109. In a letter dated 8th June, 1922, to Sir Lawless Hepper in reply to the one received from him dated 12th May, I said, " Your letter amply confirms the fears I have already expressed in my letter of the 3rd June, and there is not the slightest doubt that a drastic change is necessary in the administration and execution of the works, and if Lewis either through illness or other causes is unwilling to carry out our instructions it will be better for everyone if he does not return." Under date 4th July, 1922, the Director of Development replied to my letter of 3rd June. The following are extracts from his letter.

> " I was under the impression that you were being kept fully in touch with the work, and that all plans and designs were being referred to you for approval.

Instructions are being issued to the Chief Engineer which will, I think, obviate any cause for complaint in the future.

In particular the Chief Engineer is being informed that all designs for important parts of the work require your approval, and this should be held to extend not only to the design of the sea wall itself, but to all connected works such as the numerous culverts which have to be constructed in it for storm water, drainage, etc.

Again the questions of storm water drainage, sewage, lighting and roads in the reclaimed area itself are likely to be more important, and to involve much more expenditure than was anticipated, and the proposal and plans connected with these services will be submitted to you.

The Chief Engineer is also being asked to send you a weekly demi-official letter on the progress of work, and to maintain a proper photographic record."

I may observe here that the weekly demi-official letters promised by Sir Lawless Hepper were never sent to me.

110. Mr. Lewis went on leave some time in June, 1922, and returned to duty in October, 1922, and during my visit to Bombay at the end of 1922 the question of the relation between the chief engineer and ourselves was discussed at a conference on the 4th January, 1923, with the Member of Council in charge of the Department, Sir Lawless Hepper and myself, when it was decided that in order to ensure better co-ordination all correspondence between the Engineers and the Chief Engineer, Reclamation Branch, should in future be addressed through the Director of Development. This was to ensure that Mr. Lewis carried out his duties towards my firm, which under the circumstances were by no means onerous and could have been carried out without friction given the willingness to do so.

111. I next visited Bombay on the 13th July, 1923, and left on the 11th August, 1923. In a note descriptive of my visit I recorded the extraordinary difficulties I had experienced in the performance of my duties, and I had already pointed these out several times to Sir Lawless Hepper and shown him my notes. On the 30th August, 1923, I wrote to Sir Lawless Hepper from London and said we had come to the conclusion that in the interest of the work arrangements should be made for the retirement of the Chief Engineer at the earliest possible date, and on the 6th September, 1923, my firm wrote officially to the Director of Development and pointed out that Mr. Lewis's health had given way and that he was not fit to remain in charge of the works. The following is a paragraph from our letter :—

> " Mr. Lewis no longer possesses our confidence. We believe he has done good work in his time but it is quite evident that there is now something wrong with him, possibly he is still suffering from bad health or he is too old for the job ; he appears to have no grip of the works ; there is no co-ordination or planning out ahead, and we are convinced that in the interest of the work an immediate change is necessary."

112. Sir Lawless Hepper replied to us under date 30th November, 1923, and confirmed the following cable, which had been sent to us on the 19th November :—

> " Your letter of the 6th September regarding Lewis's services. Lewis has intimated that he proposes to take eight months' leave due to him next July preparatory to retirement. After careful consideration Government consider it desirable to accept his proposal as settlement of question ; telegraph if you concur."

113. Mr. Lewis relinquished his appointment on the 12th July, 1924. In my judgment, and in the judgment of my firm, it was a mistake to have allowed him to return to duty after his leave of May, 1922. I am in no sense blaming Mr. Lewis. I found him in Burma and in Mesopotamia to be an engineer of ability, but his health had completely broken down, and he was clearly unfit for the responsibilities attaching to his appointment.

114. That Sir Lawless Hepper was aware of the way in which work was suffering is clear from the correspondence. For instance, in a letter dated 12th May, 1922, he said :—

> " After endless delays the railway to Colaba has been begun and I hope that under a different *régime* it may be possible to get it finished by October."

And on the 8th of June, 1922, I replied :—

> " I am very disappointed to hear from you that the railway to Colaba is just begun, because so far as I am aware there was nothing to prevent it being by this time very nearly finished."

The degree of disorganisation reached was discussed between us whenever we met, and latterly, as has been shown, all correspondence with the Chief Engineer passed through Sir Lawless Hepper's hands. As a consequence of Mr. Lewis's illness, the

lack of a business-like system in the Bombay office, and an atmosphere of hostility more easily felt than describable by a visitor from London, the work was an unhappy one for all concerned. There was a series of watertight compartments; the Chief Engineer's deputies never conferred with each other, and were in complete ignorance of what was going on in any section except their own. The essence of this work, if it was to be the success planned for, was despatch. The construction of the wall was hurried on; the delivery of the dredger was hastened. These were measures of despatch, undertaken by Sir George Lloyd (now Lord Lloyd) without the help of the directorate. Other measures to expedite work were possible, but none were undertaken. The revised estimate of 1922 contemplated a prolongation of the work, apparently without dismay, to the year 1931.

I naturally take a great interest in and enjoy visiting works with which I am concerned, but I have no hesitation in saying that I always felt in Bombay that I was up against a colossal apathy unique in my experience. The best staff in the world would have been ruined in like circumstances.

115. In my report dated 10th January, 1923, I commented upon the lack of staff co-ordination as follows :—

> " Speaking generally, I am of opinion that the works have made fair progress considering the difficulties experienced, and the shortness of staff, but I doubt if there is sufficient planning ahead and co-operation between the Chief Engineer and the Deputy Chief Engineers. If the latter are not kept fully informed as to the general programme of the work it makes it very difficult for them to look ahead in their plans and arrangements. Conferences held at frequent intervals are of great benefit to works under construction, and promote mutual confidence among the members of the senior staff.
>
> " The Engineer in charge must of necessity look many months ahead of the works and cannot spare the time for daily details. The Deputy Chief Engineers in their turn must also spend part of their time preparing the work a few weeks ahead, and the assistants confine themselves to the daily routine duties.
>
> " In particular, the annual programme of work should be worked out in the greatest detail in close conference with the officers concerned, otherwise smooth working is impossible. At the same time I discussed the matter personally with Sir Lawless Hepper and the Chief Engineer, and tried to impress upon both of them the necessity for engineering conferences."

In a letter dated 9th August, 1923, to Sir Lawless Hepper, I said :—

> " In conclusion, I would invite a reference to paragraph 11 in my report to you dated 10th January, as I am still of opinion that more co-operation between the Chief Engineer and his deputies and more joint conferences would tend to facilitate the work."

Sea Wall.

116. There was an idea prevalent in Bombay that an exceptionally strong wall would be required in Back Bay to withstand the force of the monsoon sea and Mr. Kidd had proposed a solid upright concrete wall for the length exposed to sea attack (9,300 feet) and rubble stone embankment protected with 20-ton concrete blocks for the remaining 12,924 feet. Mr. Meik and I disagreed with Mr. Kidd as to the force exerted by the sea and designed a stone rubble embankment protected on the sea side by 20-ton concrete blocks. As soon as the project was sanctioned Sir George Lloyd was as already explained anxious that the work should be put in hand with the least possible delay and the month of October, or at latest, November, 1920 (by which time the monsoon would be over) was fixed upon as the date to be aimed at. It was possible to do so and in a letter to Sir Lawless Hepper dated 27th February, I repeated what I had already said in a letter to Mr. Monie, viz. : that after due and prolonged consideration it was my conviction that if the work was to be started by November there was no other way to do it than by giving a contract to Colonel Grisewood's syndicate (the Indian Construction Company) for the first section, as they were on the spot and had a staff ready to hand. After I left Bombay in 1920 a contract was arranged with the Company but on further consideration it was withdrawn and the Governor in Council decided that the work should be carried out departmentally. It had also been decided by the Government of Bombay to begin the work at both ends and I had received instructions from the India Office to that effect. It was now apparent that the work could not be begun during the fine weather of 1920-21 and in August, 1920, Mr. Meik and I had a long conference in London with Sir Lawless Hepper and Mr. L. W. Lewis as to the best methods of procedure.

117. A memorandum dated 12th August, 1920, by my firm was considered by the conference. We said that having regard to the fact that the work was to be carried

out in two places simultaneously the most suitable and speedy manner would be to let a contract for the 8,000 feet of wall from Colaba Point (known hereafter as the Colaba contract) and to carry out the remainder of the work departmentally making use of contractors for small contracts and piecework. We proposed to construct the 8,000 feet of wall from Colaba Point entirely of concrete blocks, not on account of the strength of the sea but because the foundations for the whole wall would be on the solid reef which was exposed at low water rendering construction easy. We considered the work lent itself to execution by contract and we proposed that tenders be invited publicly by advertisement in the Indian press. Our proposals were agreed to and my firm prepared complete specifications, forms of tender, schedules of rates and contract drawings for the work. Tenders were in due course received from Messrs. Pauling & Co., Ltd., Messrs S. Pearson & Son, Ltd. (Sir Frederick Hopkinson's firm), the Indian Construction Syndicate (Colonel Grisewood's firm), and I believe several other firms, but I have not beside me any particulars of the tenders.

118. There was a special meeting on the 8th February with Sir Lawless Hepper, Mr. Lewis and myself to consider tenders received. I have not the proceedings of the meeting but so far as my recollection goes we unanimously considered that for various reasons the work could better be done departmentally. Meanwhile I had been giving the subject serious consideration from other points of view and I came to the conclusion that in the interests of economy it would be better to dispense altogether with the block wall and to revert to the scheme for a rubble wall throughout. I discussed the matter with the Chief Engineer, Mr. Lewis, who was greatly taken with the idea.

119. The present state of affairs is that 8,000 feet of wall from Marine Lines has been completed, the method of construction being to tip whole trains of stone from a timber gantry and when the rubble mound has reached the required height to build thereon a concrete superstructure. The work was carried out so far as we are in a position to know in accordance with the specification furnished by my firm, and we stipulated that if stones of sufficient size could be obtained from the quarry the 20-ton concrete blocks could be dispensed with. At the Colaba end 11,778 feet of wall have been practically completed. As the depth of rubble was small the rubble mound was built by means of end tip wagons. I had frequently to criticise the construction and to draw attention to our specification for work and material. There is now only a gap of 1,800 feet to complete the whole length of the wall.

120. When I went to Bombay in 1924, I took with me detailed drawings for the completion of the parapet, &c., and in a letter dated 8th January, 1924, I sent them to the Director of Development for his consideration. On my next visit to Bombay in December, 1924, I drew the attention of the Director of Development to the time that had elapsed and again asked which alternative the Government approved. A reply was sent to us on the 17th December, 1924.

121. I consider the wall a success although I do not believe it was carried out strictly in accordance with our specification and it has cost more than was necessary. In this connection the particulars of cost given by Sir Lawless Hepper in his evidence are absurdly inaccurate, and the statement of Mr. Elgee that he had no specification to work to can only have one meaning, viz., that he, the Engineer responsible for this most important work, was not placed in possession of the specification, and that therefore he was proceeding blindly where an expenditure of many lakhs was involved.

Storm Water Drains.

122. It is assumed in the evidence, why, I do not know, that we forgot or neglected the question of storm water drains.

In my estimate dated September, 1919, I put down 79 lakhs for roads, drains and lights, Mr. Kidd having allowed 59.45 lakhs, and in my memorandum dated 15th February, 1921, I observed " a work which is not urgent but must be arranged for is the prolonging of the storm water drains from the present sea front to outside the new wall," and in a letter at the beginning of February, 1922, to the Chief Engineer I observed as follows :—

> " I enclose herewith copy of the revised estimate of the Back Bay Reclamation Scheme. Roads, lights and drains was originally estimated at 59.45 lakhs and increased by me to 75 lakhs. I have retained the latter figure as the general lay-out has not been settled, and although prices are still uncertain, if anyone can judge by what is going on elsewhere, they should have dropped considerably by the time the scheme is sufficiently advanced to build roads on the reclaimed area."

123. It should be borne in mind that it was not possible to design the drains, Cross bunds or locate main roads until more was known about the lay-out of the reclaimed

area, and the preliminary scheme of Mr. Davidge, the expert town planner, was not received by me until March, 1922. After the lay-out had been received and approved by the Development Directorate we wrote to the Chief Engineer and asked for certain sections and levels in order that we could take up the question of the storm water drains, and on the 14th September, 1922, the Acting Chief Engineer wrote that he hoped to send us the plans and sections of the storm water drainage area in about a fortnight's time, but in a subsequent letter said that he had been instructed by the Director of Development not to send the plans, as the work was not within the scope of our duties. This seemed to us rather extraordinary as on the 4th July, 1922, Sir Lawless Hepper had written to me as follows :—

> " Questions of storm water drainage, sewage, lighting and roads in the reclaimed area itself are likely to be more important and to involve much more expenditure than was anticipated, and the proposals and plans connected with these services will be submitted to you."

124. Meanwhile the Chief Engineer took in hand the designs on his own account, but on the 5th January, 1923, I wrote the following letter to Sir Lawless Hepper :—

> " On the assumption that the arrangements discussed with Sir Chimanlal Setalvad are approved I should if you agree like Mr. Halcrow to look into at once the proposals for storm water drains and the East Colaba Reclamation Scheme in order that he may get together the data necessary to enable us to prepare the working plans, &c. I also propose to discuss the methods of execution proposed by Mr. Lewis."

125. I also wrote to the Chief Engineer and said I should be glad if he would place at my disposal all the information he had on the subject. On the 8th January, 1923, the Chief Engineer wrote :—

> " An inspection of Mr. Davidge's plan indicates the position of the storm water drains for the area of the reclamation. The drains have obviously to discharge under the sea wall and will naturally be placed on the axes of the main avenues running east and west across the area."

And on the 26th January, 1923, he wrote saying that he had prepared a design of the drains after having been told by Sir Lawless Hepper that they would not be included in the work carried out by our firm. On receipt of the plans we went very fully into the subject and wrote a reported dated 18th April, 1923.

126. We criticised the Chief Engineer's method of construction and said with regard to the request in your letter No. 649 of 5th February, 1923, for two 10-ton steam cranes of the gantry type we are of opinion that you should be able to carry out the work on the drains with the plant now on the site, and we suggested that all the points raised by us should be fully considered in consultation with the Director of Development.

127. We estimated a minimum saving under our scheme of 1 lakh 32,000. It was finally decided by the Director of Development to let the Chief Engineer have his own way, and on the 28th June, 1923, we wrote the following letter to the Chief Engineer :—

> " We have received your letter No. 8573 dated 6th June, 1923, replying to ours of 18th April, 1923.
>
> " From this we observe that the construction of the forms for the concrete blocks and other preparations have now proceeded so far that you have decided with the Director's approval to make no change in your original plans.
>
> " At the same time we may say that having carefully compared the alternative schemes and the estimate of comparative cost in your letter, we are of opinion that a considerable saving would have been effected had the drains been constructed according to the method we proposed."

Dredging.

128. In previous paragraphs I have stated that I accepted the data compiled by Mr. Kidd as to the nature of the material to be dredged and the area in the harbour available for dredging and I have given my reasons for so doing. It is assumed in the evidence that I did not avail myself of the experience obtained in the large reclamation works at Sewri carried out by the Bombay Port Trust. The assumption is incorrect. In fact a great deal of the evidence heard by the Committee in respect to dredging and dredging plant is, so far as I am concerned, incorrect.

129. My original plan of operations was, I maintain, practicable when proposed by me and is still practicable, but quite obviously a work of such magnitude, however well planned, requires constant consideration and revision to meet new problems that arise. In March, 1921, the Bombay Port Trust raised the question as to dredging in the

harbour, and the following extracts from the correspondence between the Chief Engineer, Mr. Lewis and myself are of interest:—

Mr. Lewis to Sir G. C. Buchanan. 4th March, 1921.

"One point has been brought forward, not officially as yet, which is interesting—it appears that the only authority which can sanction any alteration of the port of Bombay such as removal of the bed of the harbour is the Port Trust. Well, although the Back Bay scheme has been based on the pumping of the bed of the harbour since 1905, the Port Trust have never been approached on the subject. I was told by one of the Port Trust engineers that should we start dredging his duty would be to inform the Port officer and have the work stopped. I mentioned this to Hepper who remarked that that was not going to stop the Back Bay Reclamation."

Mr. Lewis to Sir G. C. Buchanan. 11th March, 1921.

"We have received a letter from the Port Trust asking that the trustees should be informed of the details of the scheme of dredging in the harbour in order that they may express their views, in so far as they are concerned, as Conservators of the Port under the powers reserved to them under the Indian Ports Act, 1908.

"They go on to say that it will be necessary for them to consider the possible effect on the channels and currents of the harbour of the removal of large quantities of material. The control of the position of the dredgers and pipe lines with reference to the navigation of the Port is another matter with which the Trustees will require to be consulted.

"All the information that I have is that the sheet of soundings from which I am going to take out the quantity of material available and finding out what will be the outside figure required. I will give them an area over which we dredge which possibly may be considerably less than Mr. Kidd's original area which he said contained three times the amount of material necessary for the work. It is a pity that this view of the question was not gone into earlier. Apparently, since 1905, it has always been the idea that the dredging should be done in the harbour and pumped across to the Back Bay, but the Port Trust have never been officially told that such was the intention. They only discovered this a short time ago and this is the result."

Sir George Buchanan to Mr. L. W. Lewis. 7th April, 1921.

"I am very busy going into the question of the quantity of material to be dredged from the various areas, and the position and number of pipe lines required, and will send you a report as soon as possible.

"I need hardly say there is nothing in the questions raised by the Port Trust and the people in Salsette, indeed the opinion of the latter can only be described as fantastic.

"That questions should be raised after the work has actually begun is very annoying, and is one of the results of the system of carrying out large public works in India. In this country, as you know, the consent of the Legislature to a Private Bill would be necessary, and every one concerned would be given the opportunity of formulating their objections to the scheme."

Mr. Lewis to Sir George Buchanan. 9th April, 1921.

"I hope that your meeting with McMurray will have had the effect of the abandonment of the Ormiston Street pipe line. The more I think of that job the less I like it. By the way, I see that in your report you took Kidd's figures as to the amount of material available for filling of the reclaimed area. I have just had the cross sections plotted and the area taken out and I find that the amount of mud and blue clay is together only 38 million cubic yards. There is a certain amount of hard and soft moorum according to the sections which the dredgers could easily remove with the help of the cutters, this will mean that if it can all be utilised we shall probably have sufficient material up to cross section No. 44 or 46. If these sections prove correct then we should certainly be able to put in the first pipe line across the peninsula considerably lower down than Ormiston Road. McMurray had the idea of putting the intermediate pumping station somewhere near the Arthur Basin."

Sir G. C. Buchanan to Mr. Lewis. 13th April, 1921.

"I have not yet finished my report on the pipe lines, as we are going into the matter in considerable detail, but one point is certain, and that is we must have a line down the Ormiston Road or in that vicinity.

" I enclose tracings showing alternative location south of the Ormiston Road at the Arthur Basin. Will you kindly look into the practicability of that line. Meik thinks there should be no difficulty in tunnelling under the railway sidings and under the railway below Wodehouse Bridge. Whilst at Arthur Basin you could if preferred lay the pipes on piles inside the Basin, or you could go along the Arthur bunder road.

" If on investigation the proposed new location is practicable, will you please send me a cablegram to that effect."

Mr. Lewis to Sir G. C. Buchanan. 22nd April, 1922.

" I shall be very glad to hear the decision that you will have come to as regards the Ormiston Road pipe line. Mitchell was in seeing me about the Mumbra sand which he finds is considerably better than he expected. He has been doing some work for the Port Trust about the mud and silt which is obtainable from dredgings, also the blue clay. He is of opinion that the material is very poor for reclamation works, the Port Trust's experience shows that it is none too good, but Mitchell has been examining samples for some time now and his opinion is that the material will never get a proper chance of drying out. It might get somewhat harder during the hot weather, but the advent of the rains would immediately turn it to slush again. Whether the layer of moorum will be of much use, with a soft material under it is another doubtful matter."

130. On the 25th April, 1921, we sent to Mr. Lewis our programme of dredging operations on the assumption that the dredger would begin work about December, 1922, or January, 1923, and also a report on the objections of the Port Trust.

Mr. Lewis to Meik and Buchanan. Cablegram dated 6th May, 1921.

" Referring to your letter of the 13th ultimo proposed location practicable, sending by this mail latest map of locality."

Mr. Lewis to Sir G. C. Buchanan. 6th May, 1921.

" I have to-day sent you a cable informing you that the proposed location of the pipe line at Arthur Basin is practicable. I am sending herewith a copy of the latest map of this part of Bombay. You will notice that our pipe line crosses a very large number of railway lines. In all probability the railway will want to do the work under their own lines and probably within their own boundary."

Sir G. C. Buchanan to Mr. Lewis. 12th May, 1921.

" Mitchell's poor opinion of the material for reclamation is certainly disconcerting but it cannot be any worse than the material used at Sewri."

Mr. Lewis to Sir G. C. Buchanan. 14th May, 1921.

" The problem is, will the moorum be necessary and if so will it be possible to get the amount of material and transport it in the requisite time? I mentioned the matter to Hepper, who asked me to write to you about it. His idea is that it will be a good excuse for an underground railway through Bombay, commencing somewhere near Sewri, as an underground line, tube, but coming originally from Trombay, where the moorum might be obtained. The line would go from Sewri approximately to Marine Lines or to within a mile or so thereof and we should have a rising branch coming up into somewhere near our yard. After the railway had served to bring down all our material it would be handed over to the Bombay people as an extra convenience. Talking about this we put the cost down at about two crores and a half."

131. *Mr. Lewis to Meik and Buchanan. 20th May,* 1921.—Criticises programme of dredging operations and wall construction and says he does not think that the dredger will pump an ounce of material into the reclamation before the cold weather of 1923-24.

Mr. Lewis to Sir G. C. Buchanan. 20th May, 1921.

" I think I mentioned the matter of the moorum topping in my last week's letter, well that has been giving me a lot of thought, it made Hepper scratch his head when I put the figures before him. Well it has occurred to me that there must be some material available in Back Bay, and as we know the foreshore is of sand, I have found some borings which were made along a line which is for a certain length just about the line of our wall. That shows considerable depths of sand and moorum as well as clay and it seems to me advisable that the bottom of Back Bay should be investigated. Do you know why the filling has always been proposed to be taken from the Harbour and not from the Back Bay itself. We know that the foreshore is all sand, from the Cuffe Parade to Chowpatty and we know that all up the coast there are stretches of sand where the bare rocks

do not crop out. Is it that the reefs and rocks in Back Bay have frightened the people off the idea of obtaining all or some of the filling from the Bay instead of the Harbour? I have been talking to Mitchell, who has been investigating the mud and clay in the harbour for the Port Trust. He tells me that he does not think that the mud, and equally so the clay, will ever get rid of their water. During the dry season they will do so to a certain extent, but the return of the monsoon will put things back where they were. The filling of the reclamation with this rather unsuitable material will make things much more difficult for the builders on the reclaimed lands and will also put off the time of utilisation. These points do not concern us as the engineers whose task is to reclaim, but they will have a very definite effect on the success of the job as a whole. Hepper is quite keen on the investigation of the bottom of Back Bay. What do you think of it? It would mean the filling from the sea side instead of from the land side, but that would make it easier to get the slope, from the wall to the original shore line as designed. Quite how it was to be done, pumping from the land side, has been a problem I have been content to leave to the future, just under present circumstances."

Mr. Lewis to Sir George Buchanan. 28*th May*, 1921.

" Have you ever seen any results of borings or other evidence on which Kidd based his opinion as to the unsuitability of Back Bay as supply of dredged material for the Reclamation? That would be an immense saving."

Sir G. C. Buchanan to Mr. Lewis. 22*nd June*, 1921.

" *Possibilities of dredging material for reclamation from Back Bay.*

" We have always held the view that there is so much rock in Back Bay and in many cases near the surface, that it would be quite impracticable to use a suction cutter dredger on a large scale. You might get a considerable quantity of material in pockets, by means of a grab dredger loading into barges, but it is probable that the cost would be heavy. Alternatively it is possible that a certain amount of material in the locality marked with an x on enclosed plan No. 3257 might be made available by dredging with the " Kalu " or even the big dredger, for reclamation of the northern area, and we certainly think it will be worth while taking borings to ascertain the position of the rock as if you could reclaim a portion of the northern section by this means it would be much cheaper than by taking it from the harbour.

" One point, however, must not be overlooked, namely, that dredging in Back Bay to any great extent will materially increase sea and wave action during the monsoon.

" I may say that we do not accept without more information Mr. Mitchell's very pessimistic view of the nature of the material we shall get from the harbour, as we hope there will be a great deal of hard clay that will require very little moorum topping.

" McMurray tells me that he discussed the matter with Mitchell in another connection, namely, the possibility of the Port Trust using what amounted to surface dredgings, for their own reclamation works."

From Meik & Buchanan to Mr. Lewis. 7*th July*, 1921.

" In several of your D.O. letters to Sir George Buchanan you have remarked that the following subjects have attracted your attention :—

" (*a*) The material to be dredged from the harbour for the use as filling in the Back Bay reclamation.

" (*b*) The quantity of moorum to be used for topping within the reclaimed area and the best method of obtaining same.

" We have given these matters serious consideration and beg to observe as follows :—

" 2. *Suitability of dredging material for reclamation purposes.*—We understand that Mr. Mitchell has reported unfavourably of the material from an examination of samples supplied by the Port Trust.

" We have no personal knowledge of the quality of the material, and Sir George Buchanan, *vide* para. 34 of his report on the whole scheme, dated September, 1919, relied on the following specific statement made by Mr. Kidd in his report dated 3rd August, 1912. (*Not reproduced.*)

" 3. As already stated by Sir George Buchanan, there is no reason to doubt the accuracy of Mr. Kidd's observations, accompanied as they were by no less than 1,314 borings, and, although it is impossible to come to a definite conclusion until the dredger has actually been at work on the site, we believe that with proper drainage the material will be found suitable for reclamation purposes.

"4. *Moorum topping.*—Sir George Buchanan in his estimate dated September, 1919, allowed for 1,919,000 cubic yards of moorum, that being the amount necessary to cover the whole area of the reclamation one foot thick, and also provide for some additional moorum on cross banks and behind the mass concrete wall at Colaba.

" Sir George Buchanan estimated for what he considered the maximum quantity of moorum, but it is obvious that in the absence of any lay-out his figures could only be regarded as approximate.

" 5. We have now obtained from Mr. Davidge a copy of the lay-out prepared by him, and our considered opinion is as follows :—

" (*a*) Until the nature of the dredged material is ascertained by actual experience it is useless to attempt to estimate the total quantity of moorum required.

" (*b*) Under any circumstances it would be folly to cover with moorum ground which it is intended shortly to build over, as the expensive moorum would be largely dissipated during the course of excavation for the foundations of the buildings.

" (*c*) We are, therefore, of the opinion that all the moorum that need be estimated for at present is the quantity to cover roads and cross-roads and possibly the recreation grounds, and assuming that one foot is sufficient thickness, the total quantity is approximately 750,000 cubic yards, or say, 1,000 trains of 50 trucks, each truck containing 400 cubic feet.

" We are also strongly of opinion that the foundations of public buildings should, wherever practicable, be constructed before the filling is pumped into the area to be reclaimed.

" We may say that Mr. Davidge concurs in the foregoing conclusions.

" 6. We hope that it will be possible to obtain all the moorum required for the Back Bay scheme in the vicinity of the Kandivli quarries and bring it down from time to time as each section of the reclamation is completed, and we would emphasise the fact that as the deliveries will be spread over five years, or probably more, it should be possible by judicious arrangement to transport the moorum without undue interference with the transport of the stone."

Mr. Lewis to Sir George Buchanan. 22*nd July*, 1921.

" As far as the moorum is concerned, I think that the total quantities will be much less than we have allowed for. In the first place, it would not be any use putting moorum over the areas to be devoted to gardens, parks, &c., for nothing but the very hardiest things will grow on moorum, which always contains a good proportion of stones. Then on spaces to be devoted to house building, it seems rather unnecessary to place moorum over the spaces actually covered by the houses. All foundations will have to be taken down to bed rock and the floors will probably have to be suspended on girders, so that the utility of having two foot of moorum over the areas, other than those on which the roads will be laid, seems very doubtful."

Mr. Lewis to Meik & Buchanan. 28*th July*, 1921.

" I have to acknowledge receipt of your letter of the 7th July, 1921, referring to the material to be dredged from the harbour and the quantity to be used for moorum topping.

" I have noted your remarks and do not propose to go further into the subjects until we find by experience what is the character of the material we have to deal with.

" As regards the moorum, I had come to a very similar conclusion as to the extent to which it would be required, as you will see from various letters that I have written to Sir George Buchanan."

Letter from Sir George Buchanan to Sir Lawless Hepper. 8*th June*, 1922.

" In the matter of dredging it seems to me that for some reason of his own Lewis has made up his mind to delay operations as long as possible and to begin reclamation at Marine Lines instead of at Colaba."

Letter from Sir G. C. Buchanan to Mr. O'Rorke. 5*th July*, 1922.

" Mr. Meik and I have been discussing the dredging problem and although if good material is found in Back Bay it will be very useful for the Marine Lines end of the reclamation we cannot see that it will be practicable to dredge from Back Bay for use at Colaba or indeed for the bulk of the work.

" The samples sent by you are not particularly good and you do not mention if there is any sand overlying the hard moorum bed."

Sir G. C. Buchanan to Mr. O'Rorke. 13th June, 1922.

" In the matter of dredging, you observe that a detailed survey of Back Bay is required to determine the possibility of dredging there instead of in the harbour as this year's preliminary operations showed there was a large area of dredgable deposit of better quality than that available in the harbour. We certainly never understood that there was any suggestion that all the material for reclamation could be got from Back Bay."

Sir George Buchanan to the Chief Engineer. 11th December, 1922.

" With reference to the informal conference on the 8th instant on the subject of dredging at which were present yourself and Messrs. McMurray and Halcrow, I think it may be as well to record briefly what occurred.

" (1) To begin with I pointed out that the successful reclamation of the enclosed area by pumping material dredged from the sea bed was the crux of the whole scheme. I said that the general plan of operations proposed by Mr. Kidd, viz., dredging from the harbour side of the Colaba Peninsula and pumping through pipe lines across the peninsula had been accepted and arrangements made accordingly. Further that we were aware that you had been investigating the prospects of obtaining materials from Back Bay itself and we agreed that a portion of the area near Marine Lines might most usefully be so reclaimed, but that your idea of reclaiming the whole area by dredging from Back Bay was a deviation from the original and sanctioned project which required very grave consideration, the responsibility resting with my firm.

" (2) It is understood that you have fears as to the suitability of the material in the harbour although Mr. Kidd took a great number of borings and expressed himself as entirely satisfied with the result and Mr. McMurray observed that too much credence should not be given to borings as from his experience at Sewri borings were found to be unreliable.

" I remarked that in my judgment the first thing to do was to ascertain the precise nature of the material in the harbour by a practical test and we discussed the various methods short of beginning the reclamation, viz., by grab dredger, the " Kalu " or by a bucket dredger borrowed from the Port Trust, and finally, Mr. McMurray suggested that the new large grab dredger being built for the Port Trust and expected out in a few months and which had to be tested somewhere might be requisitioned for the work. It was then agreed to negotiate with the Port Trust for her use.

" (3) With reference to Back Bay it is understood that you are continuing your investigations and it was suggested you might obtain from home a heavy Priestman grab using it with your own crane and barge.

" (4) Your programme of work contemplates beginning dredging operations in the season 1924-25 and I emphasised the tremendous importance of starting before that date and said it had certainly been our intention to lay the first pipe line across the peninsula at the earliest possible date and get the dredger to work. It was then agreed that the dredger must begin work not later than the end of 1923 monsoon."

132. From the correspondence it would appear that in the first instance the Bombay Port Trust were only concerned with the possible effect on the channels and currents of the harbour of the removal of large quantities of material and the first intimation we had that there was to be any curtailment of the area selected by Mr. Kidd was conveyed to us in a letter from the Chief Engineer, dated 7th September, 1921, forwarding the correspondence with the Bombay Port Trust and the Royal Indian Marine on the subject. The Port Trustees in addition to curtailing the area observed that they had been advised they should be compensated for the removal of the soil, &c., from the bed of the harbour. The action of the Port Trust came to us as a great surprise. Mr. Kidd in his report, dated 3rd August, 1912, stated, " It has been assumed that no royalty will be payable for the removal of the mud and clay from the harbour," and as the Government of Bombay had accepted Mr. Kidd's scheme and forwarded it to the Government of India with the remark that all doubtful points had been settled, one might be excused for thinking that the Government of Bombay had long ago investigated any rights or supposed rights of the Port Trust or Indian Marine.

133. In a note to the Director of Development, a copy of which accompanied the chief engineer's letter to us dated 7th September, 1921, he pointed out that the reduction

of material due to the restrictions demanded by the Port Trust and the Royal Indian Marine amounted to 15,572,896 cubic yards, and he suggested that this quantity should be obtained by extending the dredging area out into the harbour which would, however, entail the purchase of additional pipe line.

134. The extracts from the correspondence also show that our anxiety as to the quality of the material was largely connected with the depth of moorum it would be necessary to lay on the pumped filling for the purpose of making the reclaimed area fit for use. Otherwise we had and we still have no doubt that the material is available in the harbour in abundance for the working of the dredger. The Chief Engineer was obsessed with the idea that possibly all the material could be found in Back Bay, and in his report, dated October, 1922, accompanying his project estimate he remarked :—

> " There is a possibility which is being investigated of material being obtainable from Back Bay, but this point is not yet decided, and it is considered desirable to make provision for the trenches and the shore pipe line should it be necessary owing to the investigation giving negative results."

135. The Chief Engineer's programme of operations did not contemplate beginning dredging until 1924-25. We strenuously combated that idea, with the result that dredging began in 1923-24, but in our opinion there was no reason why dredging should not have been started in 1922-23. With regard to dredging in Back Bay we did not initiate that proposal, but welcomed the idea that as the dredger " Kalu " happened to be available she should be employed to augment the work to be done by the " Sir George Lloyd."

136. We relied on the statement made by the chief engineer as to the quality and quantity of the material in Back Bay, but as events have turned out the borings taken by Mr. Thomas under the supervision of the chief engineer have proved wholly unreliable.

137. As regards the dredger " Sir George Lloyd," we hold the opinion that whatever the class of material (short of hard rock and moorum) no better dredger could be procured for the purpose of the scheme, and criticisms on the mechanical efficiency of the dredger are beside the point, because up to the present the dredger has had no opportunity of showing what she can do.

138. I do not propose in this statement to discuss in detail the working of the dredgers during the two seasons when I was in Bombay. A great deal has been said about soft clay, unctuous clay and hard clay, but the fact remains that there is, I firmly believe, an ample supply of suitable material to feed the dredger if she is properly handled—Mr. Brims, the dredging superintendent, has said that the dredger could do her specified output for possibly a month on end, and if for a month, why not for six months. He also said he accepted Mr. Kidd's soundings, &c.

139. Mr. Girdwood had no fault to find with the dredger and said the cutter would remove any material in the harbour, down to a certain depth, presumably until the hard was reached.

140. The human factor is, however, all important and until proper team work is instituted along with a 24 hour day and a bonus on output the results are bound to be unsatisfactory.

Summary.

141. My considered opinions on the scheme and on the events that have taken place since the work began are as follows :—

(1) There was no undue haste shown by anybody in proceeding with a work which was begun in 1865, had been discussed and rediscussed for years, and for which no fewer than 18 different sets of plans and estimates had been prepared since 1887.

(2) Certain sections of the community in Bombay have always exhibited violent hostility to the scheme, and this was intensified with the slump in land values which has occurred during the last year or two.

(3) The Governor of Bombay (now Lord Lloyd) was justified in his attempt to break through the traditions of the Public Works Department and get the work put in hand as soon as possible after it had received the sanction of the Secretary of State, and the procedure adopted was a very usual one. All great schemes, however well planned, require perpetual reconsideration and revision to meet new problems, and this work was no exception to the rule.

(4) In the matter of the estimates, I insist that my original estimate of 367 lakhs was reasonable and reliable and that Mr. Kidd's estimate of 1912 was excessive. I resent the suggestion made by a member of the Committee that my estimate was made low in order to obtain administrative sanction or to show a

profit on dealings in land, and in this connection it must be borne in mind that even on the 702 lakh estimate the Government of Bombay prepared a statement in which an ultimate profit was shown amounting to 369 lakhs of rupees. Estimates for engineering works in the East advanced between 1912 and 1919, but the great advance was between 1919 and 1922, largely on account of the sudden rise in the price of labour as well as in all materials.

The estimate of the chief engineer in 1922 for 702 lakhs should have 136 lakhs deducted to make it comparable with my estimate for 367 lakhs, and I believe a contractor freed from Government restrictions would have completed the work and made a profit on the chief engineer's estimate. Moreover, I still think that the work can be completed within a reasonable margin of that estimate.

The estimate of 1,100 lakhs prepared by the Special Advisory Committee under the chairmanship of Sir Lawless Hepper was admittedly " prepared to order " and was not an engineer's estimate. It would be interesting to know precisely the reason for its preparation and publication.

(5) Regarding my responsibility, I have no desire to evade any responsibility or unduly to blame anyone else. During the course of this enquiry I have been subjected to attack not only by witnesses but by members of the Committee. I quote below the statements made by members of the Committee along with my explanation.

4.8.26. *Sir F. Hopkinson.* Witness: *Sir Lawless Hepper.*

Q.—Sir George Buchanan says that for years he has been struggling against Government extravagance and inefficiency. Is not he responsible for extravagance and inefficiency?

A.—Exactly.

13.8.26. *Sir F. Hopkinson.* Witness: *Mr. H. S. Elgee.*

Q.—Is it not a fact that if anything has gone wrong with the provision of plants, the control and conduct of the works out here, it is to be attributed in the end entirely to Sir George Buchanan. Was not he the chief engineer in direct control of the whole scheme?

A.—Yes.

Q.—In fact, he is just in the position of a contractor and the chief engineer is in the position of a contractor's agent?

A.—Quite so.

Q.—If a contractor tells you to do a work, as his agent, you are responsible for carrying on the work only as he has ordered you?

A.—Yes.

16.8.26. *Sir F. Hopkinson.* Witness: *Mr. C. K. Chitale, R.B.*

Q.—I used the wrong term just now, namely, consulting engineers, Messrs. Meik and Buchanan were not consulting engineers—they were the engineers controlling the whole work. So far as the control of the work was concerned, *they were in an almost identical position to contractors*?

17.8.26. *Sir Frederick Hopkinson.* Witness: *Mr. H. S. Elgee.*

Q.—On the 18th May, 1922, he (Sir George Buchanan) wrote another letter on the same terms saying that " We are still unconvinced that you require three of these machines at once, estimated to cost over £12,000, nor do we understand why you want 20 tons lifting power when the very heaviest of the protection blocks shown on our last drawing, No. 3259, is only 15 tons." It was for Sir George Buchanan to say, " I do not think these are necessary, and therefore I shall not supply them?"

A.—He could have done so.

Q.—If he had been in close touch with the work, surely he could say that without putting the responsibility on somebody here?

A.—I think so.

5.8.26. *Sir M. Visvesvaraya.* Witness: *Sir Lawless Hepper.*

Q.—As regards expenditure for a huge work of this magnitude, responsibility must be that of the Director of Back Bay Reclamation works.

A.—I am prepared to go as far as this. In connection with the work, it was necessary, from time to time, to let out contracts for the supply of material or for loading or for unloading stones. They were not large contracts, they were petty contracts and strictly speaking, in the terms of that agreement, I think, all the tenders on every occasion were sent to the engineers as an ordinary matter of working and having regard to the fact that Sir George Buchanan was sometimes in Australia and sometimes in Africa and at other various places, it was not practicable to send all cases of tenders for contracts that used to arise. But it may be said that in those cases I was responsible for that expenditure on them, but having tacitly accepted the situation, I think, it might be said that he was responsible.

With reference to the statements that I was in the position of a contractor and the chief engineer that of contractor's agent, or that I was responsible for extravagance and inefficiency, I would in the first place point out that I am not a contractor and I would then ask Sir Frederick Hopkinson whether he or any other contractor would undertake the smallest responsibility on the relations that actually existed between Sir Lawless Hepper and the Development Directorate on the one hand and myself and my firm on the other, viz. :—

(1) We had no power to appoint or dismiss staff or workmen. When the chief engineer whom we had nominated completely broke down through ill-health we protested, and again protested, but found it absolutely impossible to secure his removal or transfer. Would any contractor take on a work if he was told that under no circumstances whatever could he get rid of his chief engineer?

(2) We had nothing whatever to do with the employment of labour, rates of pay or the letting out of the numerous sub-contracts of all descriptions; nor were we consulted about the purchase of materials and stores in Bombay. Sir Lawless Hepper himself fixed the contract for the cement and he had a special supply department which provided stores and materials for all the work being carried out by the Development Directorate including the Back Bay scheme.

Sir Lawless Hepper erred when he said that tenders were sent to the engineers as an ordinary matter of working. I can only recall to my mind two occasions on which we were advised, and for our information only, that contracts had been placed; one was in the case of the cement and the other was in the case of some pipes for the dredger which were manufactured in Bombay.

Sir Lawless Hepper has made the remark that Sir George Buchanan was sometimes in Australia and sometimes in Africa and it was not practicable to send all cases of tenders for contracts that used to arise. What an extraordinary statement! I was not carrying out our duties single-handed. I was not even the engineer. My firm were the engineers and we had an office and staff in London actively engaged in carrying out the whole of our business.

(3) With reference to plant ordered in England, we received indents and carried out instructions. On one occasion we advised against the purchase of three steam shovels and Sir Frederick Hopkinson remarks that it was only necessary for Sir George Buchanan to say, " I do not think these are necessary and therefore I shall not supply them." That statement is absolutely incorrect. The matter was placed before Sir Lawless Hepper as the head of the Development Directorate and he passed an order that the cranes were to be purchased and there the matter ended.

(4) When I visited Bombay it was as an adviser. I had no power to say to any man on the works, " Do this or do that," as I was in no sense an executive officer. Sir Lawless Hepper was the supreme executive head of the Development Directorate. Sometimes he took my advice and sometimes he preferred the advice of his own Chief Engineer. Moreover, I had never any intention of being anything but an adviser and our fees were based on that arrangement. Had I taken charge, in the sense that Mr. Kidd proposed to take charge, I should have required corresponding fees.

(5) The provision of adequate and efficient staff was always difficult. The first year that dredging started I arrived in Bombay and found one man alone in charge of the large dredger, and on my asking what would happen if that man got an attack of fever, or any other complaint, I was

told that the dredger would have to stop work until he got well again, and it was only on my urgent representation of the case that sanction was accorded to sending a cablegram to London to get out an assistant dredging master.

(6) We were never supplied with the usual engineering details of cost, in fact I doubt if anyone ever knew what the work was costing.

(6) The creation of the Development Department and Directorate I consider, in the light of events, to have been a mistake. The Governor of Bombay (now Lord Lloyd) hoped that he would institute a new department with fresh blood, freed from the restrictions and red tape of other departments, but when he disappeared from the scene, and with him the only driving force in Bombay, the Development Directorate degenerated to an ordinary Government Department, slavishly following other departments and hide-bound by rules, regulations and restrictions.

It was a public works department being carried out on exactly similar lines to the recognised Public Works Department, and subjected to precisely the same rules and regulations, but without its experience. One branch only of the Development Directorate's activities have been examined, and I suggest valuable information would be obtained by inquiring into the expenditure and results obtained in the other departments.

(7) Regarding the Back Bay scheme, the position at present is that the constructional works as designed have proved an unqualified success. Grave doubts were expressed in Bombay as to the possibility of building at reasonable cost a wall strong enough to resist the force of the sea, and I was brought out to Bombay one year especially to observe the force of the waves, but the sea wall, as built, has resisted successive monsoon storms, and will, when the works are completed, provide a handsome sea promenade.

The filling in of the reclaimed area by the dredgers has certainly not come up to expectations. A great deal has been said about the quality and quantity of material in the harbour and the efficiency of the dredger, but very little consideration has been given to the human element in the working of the dredgers. My view is that there is an ample supply of suitable material in the harbour, and that the dredger can perform all that it was required to do under its contract and specification, but that the human element has failed completely, and under existing conditions I do not see how it can possibly do otherwise. My advice is to free the work from the incubus of Government control, get rid of the whole staff before next working season, and invite tenders from contractors for the completion of the entire work. Mr. Merrett, the Assistant Dredging Master of the dredger " Sir George Lloyd," in the course of his evidence, summed up the situation admirably. When asked in what respects the dredging in Bombay differed from work done elsewhere, he replied : " One is run by a private company and they want their pound of flesh. If you do not turn over the percentage, you have to make room for someone else."

(8) Lastly, there has been a disposition in Bombay to treat this large work (probably as large a dredging proposition as the world has seen) on a par with the building of a house or other cut-and-dried operation, and the moment anything went wrong there was condemnation of all concerned and an outcry to stop work.

This, if I may say so, is a most narrow and parochial view. The work might be regarded for India as a national undertaking and should be completed. In this particular case there have been overwhelming reasons connecting with the state of the world for the original estimate being increased. All estimates for works were similarly increased, and it would be of interest to know what increase has taken place in the estimates for the building of New Delhi, but to take one example out of many of works carried out long before the War. The original estimate for the Manchester Ship Canal was in the neighbourhood of £5,000,000, whereas the actual cost was nearer £15,000,000. Now that the work is completed you hear no complaints from the City of Manchester—which is every day reaping the benefit of this great undertaking.

I emphatically assert that the Back Bay Reclamation Scheme inaugurated by Lord Lloyd is not a failure, and there is no reason why it should not be brought to a triumphant conclusion.

The slump in land values which at present obtains is not going to last for ever, and the day will yet come when Lord Lloyd's foresight and energy in the enterest of Bombay will be recognised and gratefully appreciated.

GEO. C. BUCHANAN.

ORAL EVIDENCE.

Sir H. Courthope-Munroe, K.C.—I understand that, by the courtesy of the Committee, I am allowed to appear here to a limited extent to represent Sir George Buchanan. I appear with my friend, Mr. Melville. I understand that after you have examined Sir George, if there is any matter which he desires to go into a little more fully, or if there are any matters which have been dealt with by the Committee which he thinks want clearing up, the Committee will allow me to put further questions. I understand that to that extent only I am allowed to take part in the evidence.

Chairman.—That is exactly right, Sir Harry.

Sir George Buchanan; called and examined.

Chairman.—The statement you have been good enough to prepare for the Committee will be printed in its entirety as a preface to your evidence, Sir George. Before I commence examining you there are one or two small matters in relation to your statement which I would just like to clear up. On Page 1, the first line, you say "When I first examined the project in 1918." Does that mean "1919"? It was on the 7th May, 1919, that you got a telegram?

A.—Yes, that is so; it is 1919.

Q.—Then may "1918" be corrected to 1919? Then will you read on? You say "The date of the first scheme was 1865." We have got it from official documents that in fact the date was 1863.

A.—I accept that.

Q.—Will you therefore correct "1865" to 1863, just to get the record right. Then on Page 19 you say "A meeting was held in Mr. Carmichael's room in the Secretariat at which were present the Hon. Mr. Carmichael, now Sir George Carmichael, Sir Stanley Reed, Mr. Billimoria, representing Tata Sons, Ltd." As there is a Mr. Billimoria, on this Committee, it might be clearer if you would put "Mr. A. J. Billimoria, partner in the firm of Tata Sons, Ltd."

A.—Yes, I quite understand.

Q.—Do you consent to that correction?

A.—I do.

Q.—There is another matter on Page 112. I will hand you this document and ask you to look at the underlining in green. If you turn over the page you will see the question which you set out in your statement.

A.—Yes.

Q.—Now will you substitute "Sir F. Hopkinson" for "Chairman" on Page 112 of your statement?

A.—Certainly.

Q.—Just satisfy yourself first?

A.—Yes. I will do that.

Q.—With those four corrections the statement might be released. I think it will be more convenient to take you through your statement almost page by page. Will you turn to the first page? When you first examined the project in 1919 did you first of all make yourself acquainted with the history of previous reclamations in Back Bay?

A.—I did.

Q.—We have been told that Bombay is built upon seven islands, and Lord Lloyd in his evidence has referred to reclamation going back to the early part of the 18th century?

A.—Yes.

Q.—Did you read the evidence of Sir Stanley Reed?

A.—I have seen his evidence.

Q.—Did you notice whether or not he indicated that Bombay owes it distinguished position to successive reclamations?

A.—Yes.

Q.—The joining up of various islands and making solid ground, and the driving back of the sea along the actual sea front?

A.—Yes.

Q.—Is Sir Stanley Reed a gentleman of large experience in Bombay matters?

A.—I have always understood so.

Q.—He was the Editor of "The Times of India" for very many years, was he not?

A.—Yes.

Q.—And associated with many public affairs in Bombay?

A.—Yes.

Q.—He was a man who might be presumed to be reasonably likely to form a good judgment?

A.—Yes.

Q.—The first scheme which you deal with is what we now know as the 1863 one. That was a scheme to reclaim 1500 acres of the foreshore?

A.—Yes.

Q.—Therefore not dissimilar in extent to the reclamation scheme which we are now investigating?

A.—A little larger.

Q.—Larger as 1145 acres is to 1500 acres?

A.—Yes.

Q.—You say that owing to financial difficulties that company was voluntarily wound up. I think we have got it from Sir Stanley Reed that the company in fact did make some reclamation between 1863 and 1866?

A.—Yes, I have always understood so.

Q.—Which he said was of immense advantage to Bombay?

A.—Yes.

Q.—And the company failed, not by reason of any inherent weakness in the feasibility of the scheme, but because of the North and South War acting on the industries of India and bringing down the Asiatic Banking Corporation?

A.—That is so.

Q.—The company had got on deposit 90 lakhs in the Asiatic Banking Corporation, and its failure caused the Development Company to go into liquidation. Then you deal with 1887. The Government of Lord Reay proposed a scheme. Then again in 1897 the matter comes up under Lord Sandhurst. Then the Bombay Improvement Trust became interested in reclamation, and in addition to that there was in 1904 the Military Lands Committee. It is all set out in your statement, Sir George, and is set out correctly.

A.—Yes.

Q.—In 1905 did the Bombay Public Works Department propose four alternative projects?

A.—Yes.

Q.—And was it in 1905 that it was first suggested that reclamation should be effected by pumping across the peninsula from the harbour into the area to be reclaimed?

A.—Yes, I understand that was the first occasion.

Q.—And a year later, in 1906, there was, I think, a revised scheme dealing with 973 acres in Back Bay and 121 acres in Colaba?

A.—Yes.

Q.—So far we have got: 1887, Lord Reay; 1897, Lord Sandhurst; the Bombay Improvement Trust; the Military Lands Committee; 1905, the Bombay Public Works Department; and then in 1907 Lord Lamington appointed a Commission. So that up to that time from 1863 to 1907, had the matter been under discussion by a large number of bodies, looked at from a good many angles?

A.—Yes.

Q.—Now I come to February, 1908. In that month did Messrs. Lowther & Co. submit a scheme of a very ambitious nature to reclaim 3576 acres or 2945—one or the other?

A.—Yes.

Q.—And they offered their services to make surveys and investigations?

A.—Yes.

Q.—On the 27th October, 1910, did they put forward a proposal to reclaim 1272 acres at a cost of 358 lakhs?

A.—Yes.

Q.—When putting forward that estimate, did they state that they had been given all data in possession of Government?

A.—Yes including a series of borings in the harbour.

Q.—Was it also their recommendation that Government should do the work through the agency of a contractor on certain terms of remuneration?

A.—Yes.

Q.—On the 21st January, 1911, there comes an important letter from the Secretary of the Government of Bombay to the Secretary of the Government of India?

A.—Yes.

Q.—Is the substance of that letter to this effect—that Messrs. Lowther & Kidd had previously carried out the execution of the work in relation to the Government Dockyard in Bombay; they had intimate knowledge of local conditions; and, on Page 4,

"The reclamation will be effected by means of suction dredgers working in the harbour on the east of Colaba where the presence of an ample deposit has been ascertained, and delivering the clay at the site of the reclamation—the most efficient and economical method of carrying out reclamation on a large scale"?

A.—Yes.

Q.—Did the letter further remark that if general approval were given about 1,000 acres would be attempted to be reclaimed, and that they would require to have the necessary surveys made and estimates prepared?

A.—Yes. There is this point: "expressed his willingness to prepare designs and working drawings." Up to then they had not been prepared.

Q.—True. Then the letter says: "Immediately on receipt of the general approval of the Government of India and of the Secretary of State to the proposals submitted"—that is, the Bombay Government were urging that this reclamation should go through on the lines proposed by Mr. Kidd?

A.—Yes.

Q.—It is on page 4 of your statement. I will read it: "Immediately on receipt of the general approval of the Government of India and of the Secretary of State to The proposals submitted, the Bombay Government would cause the necessary surveys to be undertaken and estimates to be prepared, when the whole question would be thoroughly re-examined from a financial point of view, and the most promising scheme submitted to the Government of India. Concluding, the letter went on to say that enough had been said to show that a scheme of reclamation would not only provide for an urgent need of the city of Bombay, but would also prove a sound financial undertaking of the nature of a productive public work which the Bombay Government regarded with great confidence. The Government of India was, therefore, requested to submit the proposals to the Secretary of State for his general approval, as the Governor in Council was anxious the actual work should be commenced with the lest possible delay."

A.—Yes.

Q.—Then a period of nine months elapsed before the Government of India replied. On page 5 of your statement the Government of India are quoted as saying:—"Before any representations could be made to the Secretary of State it had to be made clear that the works would be reproductive, and for that purpose there was practically no data available. The Government of India did not wish to question the accuracy of the skilled engineers who had advised the Government of Bombay, but their figures had not been placed before the Government of India, and all that could be said on a general review of the case was that large estimates of that type were particularly liable to be exceeded, and that even in Bombay experience of reclamation on an open sea front of the type proposed was limited. On the proposal that the scheme, if undertaken, should be executed by Government in preference to private agency, the Government of India was not convinced, on the information before it, that the scheme, if undertaken, should be executed by Government in preference to private agency, and therefore asked that the matter should be further investigated. Finally, the Government of India asked what would be the cost of the detailed surveys and estimates, as these would be necessary before the scheme could be recommended to the Secretary of State"?

A.—Yes.

Q.—Then that is followed by a letter from the Government of Bombay to the Government of India on the 6th December. In that letter it was set out that the firm of Lowther and Kidd had offered to execute a detailed survey and investigation of the site for 1 lakh 57,500 rupees—a little over £11,000?

A.—Yes.

Q.—That is, an estimated cost of survey plans and drawings so much plus professional fees so much?

A.—Yes.

Q.—Then the Government of Bombay pressed upon the Government of India the desirability that that should be done, and at the middle of page 6 you set out an extract as being one of interest, and I will read it: "The cost of the execution of a reclamation was first estimated by the officers of the Public Works Department, and the estimate thus obtained showed that the prospect of financial success was most promising. The Governor in Council felt, however, that complete reliance could not be placed on these figures, as no officer of the Department had practical experience of work of this highly special nature. Mr. Kidd, a partner in the firm of Messrs. Lowther Kidd, who possessed all the experience and knowledge required, and who was then in Bombay in connection with the extension of the Government Dockyard which was being carried out by his firm, was struck by the exceptional opportunity afforded by the stretch of rocky foreshore visible at low tide, and offered to make a preliminary investigation of a project for reclamation,

at his own expense." Then on page 7, at about the tenth line, there comes a very important passage which we shall have to discuss later: "In Mr. Porter's letter under reply"—that shows that Mr. Porter was the writer of the letter of the Government of India, does it not?

A.—Yes.

Q.—"It is stated that experience of reclamation by suction dredging is "limited" in Bombay. I am, therefore, to point out that the large reclamations being carried out by the Port Trust afford exceptionally complete data for estimating work of this kind." Then they refer to the fact that Mr. Kidd's figures were a sufficiently close approximation to the cost of the work to justify a further investigation of the scheme, and they clearly indicate that the scheme may be expected to be productive. "Mr. Kidd's figures may be accepted with safety as a sufficiently close approximation to the cost of the work to justify the further investigation of the scheme, and they clearly indicate that the scheme may be expected to be productive. Mr. Kidd's detailed estimates could not be supplied to the Government of India, as they are not officially in possession of the Government of Bombay, but an abstract estimate was so supplied. The Governor in Council has closely examined the figures and is convinced that they have been drawn up with due care and are sufficient for the immediate purpose in view, namely, to show that the reclamation scheme will be a reproductive public work and as such deserves detailed investigation." Then this letter, which is a very long one, continues. "An alternative method of procedure is to employ an expert for the investigation and the preparation of the estimates, and to call for tenders for the execution. This alternative did not commend itself to Government, because it would not provide so satisfactorily for their control of the work. Further, Government are well aware that economy in this class of work can be attained only by securing that the suction dredgers and other plant required shall be of the best design. The difficulties which have arisen with the Port Trust dredgers serve as a warning on this point. It is also necessary that most careful consideration should be given to the arrangements for carrying out the work and to the order in which it must be undertaken, and this is more properly the work of the contractor than of a consulting engineer." At page 9, on the 3rd August, 1912, Messrs. Lowther Kidd submitted their detailed report, did they not?

A.—Yes.

Q.—That was for the reclamation of 1,145 acres?

A.—Yes.

Q.—The report was accompanied by ten sheets of drawings, photographs, bills of quantity, schedules and actuary's report. A very large portion of the report (to which, of course, we will have to refer in detail later) was devoted to discussing the extent and character of the deposit in the harbour and the suction dredger machinery; and the first matter to which Mr. Kidd appears to have devoted his attention is Back Bay. He says: "Material for Filling. The first point to receive attention was the nature of the sea bed to the westward of the proposed reclamation." That is Back Bay, is it?

A.—Yes, that is Back Bay.

Q.—"As, obviously, if sufficient material of a suitable character could be obtained there, it possessed great advantages over any other possible source. This was quickly disposed of as the conditions are a very irregular rock bottom containing pockets or thin layers of loose sand in insufficient quantity within practicable distance and—for a great part of the year—a heavy ground-swell prevails which renders the work of dredgers dangerous, and frequently wholly impossible." Therefore, we have Mr. Kidd unequivocally condemning Back Bay as an area for dredging?

A.—Yes.

Q.—Then he deals with the question of the harbour: "The next source was clearly that part of the harbour bed adjacent to the western shore of the harbour and contiguous to the proposed reclamation. This, provided the material was suitable and available in sufficient quantity, presented conditions perfectly favourable in respect of sea exposure. Survey operations were consequently directed to ascertain the extent and character of the harbour bed over an area measuring 17,400 feet long by 9,000 feet wide. This was accomplished before the advent of the monsoon and conclusively established the existence of an extensive convenient area of mud and clay, yielding within the area prospected more than three times the quantity of material required for the scheme now proposed." Then he submitted drawing No. 5 and said "A system of boring by hydraulic tubes was devised which proved to be perfectly reliable as well as rapid in action"?

A.—Yes.

Q.—Then he refers to the character of the deposit, silt overlying a deep bed of blue clay. "For the purpose of filling and making up land the mud is sufficiently suitable." That is, the mud superimposed on the clay?

A.—Yes.

Q.—" And the clay eminently so." " The clay, which is stiff and unctuous, hardens into perfectly solid ground in a very short time. As far as possible in course of execution of the works the clay would be preferred, not only because of its greater suitability for making land, but also because for dredging purposes its stiffer and more tangible character enables a higher percentage of solid material to be transported by the pumps." " For making up land in the proposed reclamation the material has to be obtained from a greater depth and delivered to a greater distance than has hitherto been accomplished elsewhere." " As a result we have made provision for a very high class plant, and the working costs have been estimated accordingly. The machinery we would employ will be designed and guaranteed to effect the removal of 2,000 cubic yards of silt or blue clay per hour from a maximum depth of 70 feet below low water." I am only making passing references to this, but might I ask you this? Is there anything in Mr. Kidd's report which throws the least doubt on the feasibility of the scheme?

A.—No, I do not think there is anything in Mr. Kidd's report which throws any doubt whatever on it.

Q.—And whilst asserting the existence in sufficient quantity of dredgable material, he adds a phrase which may have attracted your attention—that is, the phrase on Page 10 which you set out " A system of boring by hydraulic tubes was devised which proved to be perfectly reliable as well as rapid in action." Did it strike you there that he was talking about something which at first at all events had been in the nature of an experiment?

A.—All he wanted to know was where the hard material came to.

Q.—That is not an answer to my question. My question was this. When you saw that passage " A system of boring by hydraulic tubes was devised, &c.," did not that rather suggest that Mr. Kidd was embarking on something in the nature of an experiment?

A.—If you take it in that way, yes.

Q.—I am asking you how it struck you. Did that passage strike you at all that Mr. Kidd was possibly embarking on an experiment?

A.—Knowing how it was done, I should not have called it an experiment.

Q.—Did it occur to you that it might be prudent to take a few check borings to see whether Mr. Kidd was right in his views?

A.—No. I considered that Mr. Kidd's borings were ample; in fact, I had never seen a scheme with greater detailed information in respect of the material. I was quite satisfied with it, and I am still quite satisfied with it.

Q.—Was your own report, dated September, 1919, brought over to India by you or sent through the post?

A.—I took it with me to India.

Q.—You took it with you to India and presented it to the Government. In your report you do undoubtedly assert your confidence in Mr. Kidd's borings?

A.—Yes.

Q.—But you yourself of course had no personal knowledge of the character of the sea bed in the harbour?

A.—I would not say that, because I had a very general knowledge of the sea bed.

Q.—I will come to it a little later, but I think you have said that you had no personal knowledge of the character of the sea bed. You had never taken any borings?

A.—I had never taken any borings.

Q.—Beyond what Mr. Kidd put in his report, had you any information at all?

A.—Yes. I had studied the Sewri reclamation.

Q.—How had you studied that—what documents or what people?

A.—I discussed it frequently with the late Chief Engineer to the Port Trust.

Q.—Is that Mr. Messent?

A.—Yes.

Q.—Did Mr. Messent ever give you any figure of the performances of the " Kalu " and " Jinga "?

A.—No, I do not think he did. I do not remember any detailed figures.

Q.—The " Kalu " and " Jinga " had been working, had they not, from 1908 to 1913 in the Sewri reclamation?

A.—Yes.

Q.—Did you consider that the nature of the sea bed in the Sewri area was the same as that in the harbour?

A.—I always understood it was the same, yes.

Q.—From whom did you understand it?

A.—I discussed it frequently with Mr. Messent. I went over the Sewri reclamation works. I was constantly down there.

Q.—When did you go over the Sewri reclamation works?

A.—I must have gone over them several times. I was several times in Bombay between 1901 and 1924. I always knew what was going on. Mr. Messent was a very old friend of mine.

Q.—I am asking about Sewri for the moment, because, you see, the evidence up to now has really all been one way. It may be wrong, but it has been all one way, namely, that the character of the deposit in the Sewri Mazagon reclamation is all mud, very little clay and no rock, and that the material in the harbour is of quite a different character altogether?

A.—I do not agree.

Q.—So be it. In fact, if it had occurred to you advisable that check borings should be taken, they could have been taken when you handed in your report in November, and for three or four months after that, could they not?

A.—Yes.

Q.—From November you get for some months a complete certainty of calm weather?

A.—Yes.

Q.—And within a week or ten days check borings could have been made?

A.—They could. I did not think it was necessary.

Q.—I see your point, but I am asking you whether they could have been made? You were there from November, 1919, when you handed in your report, for how long—two or three months?

A.—I arrived in Bombay on the 19th May and I left Bombay on the 31st May.

Q.—I have jumped for the moment to November 1919. You will probably be able to tell me from your recollection. It was in November 1919 that you handed in your report?

A.—Yes.

Q.—How long did you stay there after handing in your report?

A.—I should think three months.

Q.—I am not pinning you down?

A.—Something like two or three months.

Q.—In that two or three months you could have arrived with certainty at the nature of the sea bed, could you not?

A.—I considered I knew it absolutely.

Q.—I follow that.

A.—I could have done it, yes.

Q.—I see your point, but still you could in fact have arrived at it with certainty by December of 1919?

A.—Yes.

Q.—Now I go back to your statement on page 12: " On the 7th August, 1912, the Bombay Government forwarded for the consideration of the Government of India Messrs. Lowther & Kidd's report and observed that the drawings might be considered as complete working drawings, which would give sufficient information for examination of the designs and for the immediate commencement of the work; the investigation had been most carefully made and might be accepted as exhaustive. The report was clear and complete all doubtful points had been settled, and the revised estimate might be accepted as completely trustworthy and ample. It was further stated that in presenting this project to the Government of India the writer was to say that his Excellency had the fullest confidence in the ability and expert knowledge of Mr. Kidd who had worked it out in detail; but in case it should be desired to obtain further expert opinion he was to suggest the names of Mr. A. W. Robinson, Montreal, who was prabably the greatest living expert in the world on reclamation by suction dredging, and who was consulted as such by the Egyptian Government, and of Mr. C. S. Meik, the eminent consulting engineer of 16, Victoria Street London, whose opinion on sea protection work might be accepted with confidence."

So Mr. Robinson is being put forward as the greatest living authority on suction dredging?

A.—Yes.

Q.—And Mr. Meik, who at a very early date after this became partner with you, is put forward as a great authority on sea protection work?

A.—Yes.

Q.—" The letter concluded that it was the earnest desire of His Excellency the Governor in Council that this project should receive the serious consideration of Government as highly productive work, an early prosecution of which was necessary for the growth and prosperity of the City of Bombay, and that it might be recommended for acceptance by the Secretary of State."

A.—I would like to emphasize that the letter from the Bombay Government says " The investigation had been most carefully made and might be accepted as exhaustive. The report was clear and complete, all doubtful points had been settled, and the revised estimate might be accepted as completely trustworthy and ample " I think that is worthy of emphasis.

Q.—I did read it, but you are quite at liberty to emphasize it, and I am glad you have done so. It is a matter we have to consider. That revised estimate was 325·61 lakhs, was it not?

A.—Yes.

Q.—And the Government of Bombay was pinning its faith and pledging itself as decisively as a Government could to the propriety of that estimate?

A.—Yes.

Q.—Then you say " The decision of the Government of India on the letter from Bombay was to postpone consideration of the scheme," which is a habit which Governments have, is it not?

A.—Yes.

Q.—" But to appoint a strong, fully representative committee to consider the general question of the future development of Bombay city."

A.—Yes.

Q.—That is rather an important moment. You see, up till now right from 1863 onwards, nothing had been discussed except the reclamation of Back Bay and just the 127 acres in Colaba. Now we get the Government of India coupling with that the general question of the future development of Bombay City?

A.—Yes.

Q.—If, as a result of the deliberations of this committee, it should be decided that the reclamation of Back Bay was desirable, a beginning would be made by following the suggestion of Messrs. Lowther and Kidd; that is, to first take in hand the reclamation of an area of 84 acres, the cost of which was estimated at 37 lakhs." Messrs. Lowther and Kidd had suggested, had they not, that there could be an alternative reclamation of a small strip of 84 acres?

A.—Yes.

Q.—And they put the cost of that at 37 lakhs. It was on that that the Government of India fastened, and said: " Well, if the committee recommend, begin on that small area." Up to this point, is it putting it correctly, in your opinion, to say that the attitude of the Government of Bombay throughout was that of a Government very desirous of having the reclamation?

A.—Undoubtedly.

Q.—And the attitude of the Government of India very cautious?

A.—Yes.

Q.—In 1916, that is five years later than Mr. Kidd's report, the late Mr. Russell was then Secretary to the Government of India in the P.W.D., and he recorded these views in March, 1916. You set them out, but the point I wish to emphasise is on page 16 : " Generally, however, the estimate seems to have been prepared with great care, and probably contemplates this." That is that certain material would settle. "Altogether in its technical aspect the work appears to be quite feasible, and presents no insuperable difficulties with every likelihood, as far as can be judged, of being carried out at its estimated cost of Rs. 325 lakhs."

A.—Yes.

Q.—That, therefore, is the considered opinion of Mr. Russell, the Secretary to the Government of India in the P.W.D., approving Mr. Kidd's plans as regards feasibility and approving the estimate? That is right, is it not?

A.—Yes.

Q.—" The sufficiency of material has now been finally settled." You would like that point emphasized?

A.—Yes.

Q.—" And the closeness of the three estimates, namely 6·7, 5·8, and 5·86 per square yard of gross area reclaimed, coupled with the fact that a reliable firm of engineers is ready to execute work at the last-mentioned rate may be taken as indicating that the estimate under consideration is probably as reliable as can be expected." So that, in its broad details, Mr. Kidd's scheme had also the approval of the Secretary of the P.W.D. of the Government of India?

A.—Yes.

Q.—Down to the bottom of page 16 is there any other matter in Mr. Russell's memorandum that you would like me to mention or to discuss with you?

A.—I take it that I shall have an opportunity later on of going into greater detail?

Q.—We must do so, of course. I should like you to understand that I am now trying to get all the introductory matter quite clear. After that, of course, we shall have to go straight through the various facts. I am now just prefacing this, so that people may understand exactly what was, according to your statement, the position of the Government of Bombay in relation to the scheme, the position of the Government of India, the position of Messrs. Lowther and Kidd, and all the people who took a prominent part in it.

A.—Quite so. I do not think there is anything which I particularly want to emphasize in this. I might say, with reference to page 15, that Mr. Kidd's project was supposed to be a complete working project.

Q.—Undoubtedly. I read that at the bottom of the page.

A.—I would also like to draw attention to the fact that Mr. Russell's remarks, at the top of page 15, " Without a great deal more detailed information as to the number, cost, and capacity of the dredgers, length of pipe-line, necessity or otherwise of a short delivery line, it is impossiblle to criticise the rate."

Q.—Yes, but it goes on to say, " but I should say that the rate of Rs. 23 should be ample ".

A.—Yes.

Q.—I had better read the whole of your paragraph 16, I think. " In November, 1912, the Government of Bombay appointed a Committee of prominent and representative citizens to investigate the financial features of the scheme, and to answer a series of questions dealing with the need for reclamation, the probable demand for building sites, the effect upon the value of existing landed property in Bombay, and other important matters. This Committee reported on the 22nd January, 1913, and concluded their remarks by saying that they wished to lay stress on the fact that the scheme was not only financially sound, but that it would add to the beauty of the City, and after some years would add considerably to the resources at the disposal of the Improvement Trust in its efforts to reclaim insanitary areas." So there, again, we find the reclamation of Back Bay linked up with the housing problem?

A.—Yes.

Q.—Then the Government of Bombay, on the 11th March, 1913, returned to the attack, and wrote to the Government of India pressing that sanction should be given to the work, and you say, " The Government of India, however, was still unconvinced and expressed the opinion that a strong representative Committee should be invoked to consider the future development of Bombay City in all its bearings, and expressed the view that if the Committee were in favour of the Back Bay scheme, a beginning should be made with a strip of land measuring 84 acres." Do you mind turning back. Is that the same Committee about which we were talking a few minutes ago at the bottom of page 13? Is this a repetition of the bottom of page 13?

A.—No, I think that is a new Committee.

Q.—That Committee, again, had their attention called to the 84 acre scheme of Mr. Kidd?

A.—There had been very many committees.

Q.—Then you say " The Bombay Development Committee was accordingly appointed by Government of Bombay resolutions dated October and November, 1913, and their report was issued in April, 1914. This report contained no specific recommendation to undertake reclamation in Back Bay on a large scale but suggested that an area of 100 acres should be reclaimed in order to provide accommodation for certain urgently required public buildings." Then, in the next two or three years, there were several schemes. The matter was not allowed to rest at all, and on the 15th September, 1916 the Government of Bombay pressed the Government of India to allow them to reclaim 220 acres, did they not?

A.—Yes.

Q.—Then the Government of India said " No, that is not in accordance with the decision arrived at in 1913 "; and they said they could only consider a much more modest scheme and only entertain it if the Government of Bombay could show that it could be financed out of provincial resources. Is that how it stood?

A.—Yes, that is how it stood.

Q.—That is the history up to the end of 1916. Then we come to the very important date of December 1917. In December 1917, did a group of Bombay gentlemen interest themselves in this question of the reclamation?

A.—Yes.

Q.—Were they Sir Sassoon David, Sir Shapurji Broacha, Sir Fazalbhoy Currimbhoy, Sir Vithaldas Thakersey and Sir Lallubhai Samaldas? That was the first syndicate?

A.—Yes.

Q.—I do not know, Sir George, whether you are in a position to tell us whether those gentlemen were very influential and prominent citizens of Bombay?

A.—I am not in a position to say so as a matter of fact, but it was generally understood that they were.

Q.—It rather sounds like it, does it not?

A.—Yes.

Q.—And not only prominent citizens, but very enterprising and very hard-headed citizens?

A.—Yes.

Q.—And they proposed to carry out the Kidd scheme for the reclamation of the 1,145 acres, did they not?

A.—Yes.

Q.—What they wanted was a concession, and they assured Government that all the necessary capital could be provided?

A.—Yes.

Q.—In the same month did Messrs. Tata Sons, Limited, also come to the front?

A.—Yes.

Q.—Did they want to have an option to consider whether they would undertake the development also?

A.—Yes.

Q.—Neither the first group nor Messrs. Tata Sons, Limited, were, I suppose, doing this for philanthropy, were they?

A.—No. I do not think it was ever suggested they were philanthropists.

Q.—There may have been a certain sentiment about the improvement of Bombay, but it is obvious from what you put in your statement, and from the evidence which we have had, that they were of opinion that there was money in it?

A —Undoubtedly.

Q.—And that the reclamation could be done according to Mr. Kidd's estimate, and that the result would be a profit to whoever undertook it? That is right, is it not?

A.—I do not think they ever gave any guarantee that they thought it could be done according to Mr. Kidd's estimate. They were not carrying out Mr. Kidd's scheme. They said that if the option were granted to them they would at once engage the requisite engineering staff to prepare a scheme of their own. I do not think they were contemplating following Mr. Kidd.

Q.—Will you look at page 18 of your own statement—" and they said that they intended to carry out the work according to the intended programme of Messrs. Lowther, Kidd & Co."

A.—Yes, the intended programme. I did not mean that they were going to pick Mr Kidd's scheme.

Q.—They were not going to be slavishly bound, but they were going to reclaim an area of 1,145 acres by suction dredging, presumably, and they believed that they could make it pay?

A.—Yes.

Q.—That they would not only reclaim the land, but would make it pay?

A.—Yes, and that if they were given the option they would at once engage the requisite engineering staff to prepare a scheme.

Q.—Then the opposing groups combined into one, did they not?

A.—Yes.

Q.—And the matter was discussed with Sir George Carmichael. At this time Lord Willingdon was the Governor, was he not?

A.—Yes.

Q.—He had, in January, 1918, about 11 months to remain in office before the arrival of the new Governor?

A.—Yes.

Q.—Was the effect of the discussions with Sir George Carmichael, with the Sassoon David and the Tata group that Government resolved to have a report by an independent engineer?

A.—Yes.

Q.—Before they had come to that decision, were Messrs. Lowther and Kidd themselves anxious to do the work as agents for Government?

A.—They were.

Q.—We need not take this in great detail, but they had been pressing from 1914 for Government to entrust the work to them?

A.—They had.

Q.—It is only business?
A.—Yes.

Q.—Mr. Kidd, I think, had left the firm of Lowther & Kidd and had joined the firm of Messrs. Armstrong, Whitworth & Co.?
A.—Yes.

Q.—And later Messrs. Armstrong, Whitworth & Co. were not indisposed to do certain reclamation work?
A.—They sent in a definite proposal.

Q.—On page 24 you set out a letter of the 9th December, 1918, signed by the Secretary to the Government of Bombay Public Works Department, addressed to the Government of India, saying " that the Bombay Government had always recognised that before the estimates prepared by Messrs. Lowther & Kidd in 1912 could be adopted, it would be necessary to have them scrutinised by an independent expert on the spot; for these reasons they desired to have the scheme examined by the best expert whose services could be secured. His report would enable them to calculate with greater approximation what the value of the concession was likely to be. The expert, said the letter, should be one who had experience in harbour and reclamation, and the knowledge of recent developments of dredging and pumping appliances." Then it deals with the fee.

A.—I would just like to point out to you, Mr. Chairman, that I say in paragraph 26, on page 24, that the Joint Secretary to the Government of Bombay addressed a letter to the Government of India——

Q.—I will ask you to wait for a moment. I have read you the letter of the 9th December, 1918. I prefer to get the story in chronological order. I will come back to that letter. For the moment let us consider the letter of the 9th December, 1918, in which the Government of Bombay were asking for the services of the best expert who could be secured. Then, on the 24th January, 1919, some six weeks later, Sir W. G. Armstrong, Whitworth & Company, Limited, were offering to do some work, as " they observed that in connection with the scheme they desired to emphasise " —this is the point you want, is it not?—" that by far the most important item governing the ultimate total cost was that of dredging, which arose from the fact that in no part of the world had any similar work been executed under anything like the same conditions as to depth from which material had to be obtained combined with distance to which it had to be delivered."

A.—Yes. What I wanted to point out was that the Government of Bombay were hardly consistent in their letter of the 9th December, 1918, in saying that before the estimates prepared by Messrs. Lowther & Kidd could be adopted it would be necessary to have them scrutinised by an independent expert, because in their letter of the 7th August, 1912, they said " that the drawings might be considered as complete working drawings, which would give sufficient information for examination of the designs and for the immediate commencement of the work; the investigation had been most carefully made and might be accepted as exhaustive. The report was clear and complete, all doubtful points had been settled." I say that that letter is inconsistent with the letter dated 9th December, 1918.

Q.—In December, 1918, the gentleman who was Joint Secretary (and it is the Joint Secretary who is writing) would not be Joint Secretary in 1912?
A.—No, they were different personalities.

Q.—You do not object to the letter of the 9th December, 1918, do you, asking for the best expert whose services could be secured; because it was by that means that you came to do the work.
A.—No, I do not object.

Q.—Now we come to an important date. The letter which I have just read of the 9th December, 1918, was written at the time when Lord Willingdon was on the eve of leaving Bombay?
A.—Yes.

Q.—And on the 25th January, 1919, which is the next date you mention, Lord Lloyd had arrived as Governor?
A.—Yes.

Q.—At the bottom of page 24 you say " On the 25th January, 1919 (by which date Lord Willingdon had been succeeded at Bombay by Sir George Lloyd) the Secretary of State for India asked the Government of India by telegraph whether the latter agreed with the Government of Bombay that the expert to be selected should be an independent person," and then he dealt with those matters which had been under discussion with Messrs. Lowther & Kidd. Then on the 5th March, 1919, the Government of India gave a history of the scheme, and stated that it was in agreement with the Government of Bombay that, with a view to a settlement of this long outstanding question, the project

should be examined by the best expert available so that an authoritative opinion on the scheme might be obtained, and the closest possible estimate of cost be framed. Then you quote, " The expert selected, the Government of India thought, should be one who had large experience on harbour and reclamation works, and knowledge of the most recent dredging and pumping appliances, and, as suggested by the Government of Bombay, should be entirely independent of any of the firms that had applied, or were likely to apply for the concession." Then we come to the telegram of the 8th April, 1919. The Governor of Bombay sent this telegram to the Secretary of State. It has been read more than once, but I must just give a summary of it to make the story intelligible. The Government of Bombay say, " Back Bay Reclamation Scheme: Government of India has asked you to send out best expert available to examine and make final report on above. Government of India has also asked us to send all plans to Delhi for transmission to you in order that expert may study them before departure. (1) I think this procedure involves unnecessary delay," that is, the sending of plans. This appears to be a personal telegram from Lord Lloyd, does it not? It says " I " think. " I have consulted the Government of India and Sir Claude Hill concurs in proposing you should send expert out at once to arrive Bombay not later than the third week of May." Then it is suggested that certain persons could advise regarding choice of experts, and now comes the mention of your name for the first time: " Failing your ability to find expert in short time available my Government would agree to using Sir George Buchanan, whose services would probably be available and whom the Government of India recommend. (6) My telegram has been drafted in consultation with the Government of India and is being communicated to them. (7) Please telegraph immediately whether expert can be found in time to arrive by middle of May, or whether we should proceed with Buchanan." Lord Lloyd's attention was called to that telegram, but he was not able to tell us who it was made the recommendation or in what manner the recommendation had been made. Do you happen to know at all?

A.—No; I do not think I can enlighten you on that point.

Q.—It does not matter; it is immaterial. On the 7th May, 1919, you got a telegram. You are then at Simla?

A.—I was then a member of the Government of India Munitions Board.

Q.—But you were at Simla?

A.—Yes.

Q.—" My Government are desirous of securing your services at once to examine and report upon the Back Bay reclamation scheme. All plans and data are here, but it would involve your being in Bombay before the break of the monsoon, and for as long afterwards as you found necessary for the preparation of your report. Please telegraph informing me whether you will undertake the work, and in a following letter suggest terms." That is a telegram from Sir George Lloyd to yourself?

A.—Yes.

Q.—Then you say: " The foregoing brings the history of the case up to May, 1919. I have gone into the matter in some detail in order to show that so far from the scheme being prepared in secrecy and forced upon an unwilling people by an arbitrary Government every possible opportunity for years had been given for free discussion, and that no less than 18 different projects had been discussed."

A.—Yes.

Q.—" The Government of India certainly showed no disposition to rush the matter, and in a letter from Mr. Montagu, then Secretary of State for India, to the Viceroy, dated 7th November, 1918, occurred the following paragraph: ' I still feel a little anxious about the Back Bay reclamation scheme in Bombay. My views are that it should be put forward as a valuable contribution to the housing difficulty in Bombay, but my views are very strongly, on the evidence before me, that if it is undertaken it should be undertaken as a Government enterprise and not given to any concessionaires.' "

A.—Yes.

Q.—To try and locate that letter, that letter was just 12 months after the Sassoon-David syndicate and the Tata syndicate had revived the matter by asking for a concession?

A.—Yes.

Q.—That must obviously have been known to Mr. Montagu, and must have been in his mind?

A.—Yes.

Q.—As to whether, amongst other things, the matter should be undertaken as a Government enterprise or be handed over to some concessionaire?

A.—Yes.

Q.—Then on page 27, paragraph 31, you say: " When I received the telegram already quoted from Lord Lloyd I was a member of the Government of India Munitions

Board; but the War was over and I was on the point of terminating my duties with the Munitions Board, so I telegraphed my acceptance of the offer." You telegraphed your acceptance, and then you say: "In a letter from Simla dated the 12th May to Sir George Lloyd I made the following remarks: 'The work is of a kind with which I am familiar, as I designed and carried out the very large river training and land reclamation scheme on the Rangoon River, while I was also responsible for initiating all the reclamation works at Basra which have transformed the river front on the Shatt-al-Arab.'" Had you up to this time any previous personal experience of reclamation on an open sea front?

A.—I do not quite understand you.

Q.—What do you not understand? Had you up to this date, 1919, any previous practical experience of reclamation upon an open sea front?

A.—If you put it in that way I say, No; but I should like to say something about that later.

Q.—In the letter you say you carried out a very large river training scheme. "River training" means, does it not, directing the river into some desired channel?

A.—Yes.

Q.—That was at Rangoon. I think the result of that work, taking it shortly, was that it was completed by you in 1913, and in 1916, three years later, Sir Harvey Adamson spoke in terms of the highest appreciation of your work in Rangoon?

A.—Yes.

Q.—And you received the honour of knighthood for that work. Then in 1916 you were employed in Mesopotamia and, as you say, initiated all the reclamation works at Basra which have transformed the river front of the Shatt-al-Arab. In 1917 you received the K.C.I.E.?

A.—Yes.

Q.—Now, continuing the letter, on page 28, you quote: "I have seen Sir Thomas Holland to-day, and I have arranged to leave Simla for Bombay on the 17th instant. I have at present only a superficial knowledge of the Back Bay scheme, but I assume that plans, cross-sections and borings are available (as there would certainly not be time to have these prepared before the monsoon) and that the reclamation is proposed to be effected by dredging outside a retaining wall marking the limit of reclamation and depositing inside the wall. In that case, one of the principal problems would be to decide on the best type of dredger, and whether at the present greatly enhanced price of these machines the scheme would be practicable from the financial point of view." You will not mind my suggesting that you could hardly have given more excellent advice? At that moment the thing which had to be considered was the best type of dredger, if you were going to rely on dredging, was it not?

A.—Yes.

Q.—Secondly, it would be your duty to consider whether you could advise the Government of Bombay to carry on the scheme in view of the enhanced prices of dredgers, boosters, pipe lines, and everything of that character?

A.—Yes.

Q.—Therefore, you must have had it in your mind when you wrote the letter that it was possible that the cost of the machines might be prohibitive, and that you would have to advise the Government not to carry out the scheme?

A.—Yes.

Q.—I think you arrived in Bombay on the 19th May, 1919, and saw Sir George Curtis; and on the 21st May you received a letter from the Governor, Sir George Lloyd, saying he was glad you had consented to undertake the Back Bay scheme, and that he thought the whole scheme depended upon the mammoth dredger, its cost, and when it could be sent out, and that he believed this was the biggest dredging scheme ever contemplated, and as such would, he was sure, interest you?

A.—Yes.

Q.—Then on the 23rd May, two days later, you wrote to Sir George Lloyd saying you had gone through all the plans and papers and had been able to form an idea of the work required, and as far as the sea wall was concerned there was no engineering difficulty: "But, as I thought would be the case, the crux of the whole scheme lay in the provision and successful working of the dredger or dredgers, and that under those circumstances the sooner I get home to tackle the dredging problem with builders of dredging plant the sooner I shall be able to decide on the best action to take." Therefore, you suggested you should go home on the 31st May?

A.—Yes.

Q.—Will you just look at the passage: "The crux of the whole scheme lay in the provision and successful working of the dredgers or dredgers"?

A.—Yes.

Q.—Was not really the first thing that had to be ascertained with certainty that you had in the harbour a material of a depth and character suitable for dredging?

A.—Yes; and I was quite satisfied.

Q.—I am putting it to you that that would be the first thing to ascertain, obviously?

A.—Yes.

Q.—If no material, no dredging proposition?

A.—Obviously.

Q.—If it should happen that although there was the material it proved to be unsuitable for the dredger, naturally the scheme would fail either wholly or in part?

A.—Yes.

Q.—We are now in May of 1919, but even as late as February of 1922, three years later, after the dredger had been ordered, were you saying: "Much depends on the nature of the matrial dredged, and that can only be definitely ascertained when actual dredging begins?"

A.—That is so; but I take it I shall have an opportunity of explaining that letter later.

Q.—Certainly.

A.—We need not go into details at the present moment. I accept that.

Q.—I am coming back to that. Would you take a copy of your reports, as we might just follow this through. Have you seen that little book before? (*Small book handed to the Witness.*)

A.—No; I have not seen it.

Q.—They are your reports on your visits to Bombay in connection with the Back Bay Reclamation Scheme. I suppose you have a copy of your report of the 11th February, 1922?

A.—I have.

Q.—These have been provided for official use. I assume them to be correct, but if they are not correct you will point out anything which is wrong. I will just take you through the various references as to the quality of the material that occur in this book, and then I would like, and I am sure the Committee would like, you to give us your explanations.

A.—These are my annual reports?

Q.—Yes. Would you turn to page 8 of that? I am just going to give you the references and then I will ask you a question on them. You say on page 8: "Much depends on the nature of material dredged, and that can only be definitely ascertained when actual dredging begins"?

A.—Yes.

Q.—I will just tell you what my suggestion is. My suggestion is, if that was your state of mind in 1922 it must also have been your state of mind in 1919, must it not?

A.—No; I do not agree.

Q.—Why not?

A.—I can explain that; but it was not my state of mind in 1919.

Q.—What had happened then?

A.—I would like to go into the question of clays, but were there any other references you desire to make?

Q.—Yes; a great number of them. Will you turn to page 12: "Wall construction will be easier and speedier than I anticipated, and the only uncertainty concerns the exact nature of the material to be dredged from the harbour and used as filling"?

A.—Yes.

Q.—That is the 11th February, 1922?

A.—Yes.

Q.—By that time the dredger was ordered, and more than £350,000 worth of plant independently?

A.—Yes.

Q.—Taking the dredger and plant up to this date, the cost was somewhere in the neighbourhood of £655,000?

A.—Yes.

Q.—I will just take you to another reference on page 25: "It has always been realised that the successful reclamation of the area enclosed, by pumping through pipelines material dredged from the sea bed, is the crux of the whole scheme." Then on page 29, paragraph 6, there is this: "In May, 1921, the Chief Engineer in letters to us raised the question as to the suitability of the material in the harbour for reclamation purposes; he said it had been very unfavourably reported on by experts, and he discussed the possibility of obtaining more suitable material in Back Bay. In our

letters dated the 22nd June and 2nd July, 1921, we quoted the specific statements on the subject made by Mr. Kidd in his report dated 3rd August, 1912, and said that we were unable to accept, without much more information, the pessimistic report as to the unsuitability of the material in the harbour and that it was impossible to come to any conclusion until a dredger had been actually at work for some time on the spot?

A.—Yes.

Q.—Having handed in your report in October, 1919, a dredger on the spot could have reduced this uncertain factor to absolute certainty, could it not, between October and December?

A.—There has never been any uncertainty in my mind as to the suitability of the material for dredging. May I read some notes I have made on that point?

Q.—Shall we just finish this, and then you can read the note, but probably you would like to see the whole of these references to which I wish to direct your attention. The next is on page 30, that is in November, 1922: "I again visited Bombay and was accompanied by Mr. W. T. Halcrow (now a member of my firm). The Chief Engineer had been proceeding with his investigations in Back Bay since my last visit, and on the 8th December, 1922, I convened a conference on the subject of dredging, at which were present the Chief Engineer (Mr. Lewis), Mr. Halcrow, Mr. McMurray, of Messrs. Simons & Co., and myself. During the conference the Chief Engineer again expressed his fears about the suitability of the material in the harbour for reclamation purposes and proposed to abandon the harbour and reclaim the whole area from Back Bay." At one time during that conference did you agree that if sufficient first-class material could be obtained from Back Bay it would be better to use it than the mud and clay in the harbour?

A.—I do not think I ever agreed to use the material from Back Bay. I do not think I ever made an unqualified agreement. The use of the material from Back Bay was not initiated by me, and I do not remember an unqualified agreement.

Q.—I have a memorandum signed by yourself dated Bombay, 16th December, 1922, and it is clearly the memorandum on which you are basing this report, and it says: "The general question of dredging was discussed." Up to this time had there been no dredging at all?

A.—No.

Q.—The dredger had arrived in March, 1922, and was laid up?

A.—Yes.

Q.—This is your own note: "It was agreed that if sufficient first-class material could be obtained from Back Bay without undue risk to the pipe-lines and dredgers, it would be better to use it rather than the mud and clay from the harbour." That was a complete reversal of the scheme, if it had been embarked on, was it not?

A.—Yes.

Q.—Originally your plan was that the "Sir George Lloyd" would go into the harbour?

A.—Yes.

Q.—She would have a pipe-line up to 5,000 feet if necessary?

A.—Yes.

Q.—She would dredge the harbour bottom down to 70 feet if necessary?

A.—Yes.

Q.—And she would pump the material through her 5,000 feet of pipe-line?

A.—Yes.

Q.—Where it would be picked up by the booster, the "Colaba," and pumped along either 5,000 feet or a less number of feet on to the proposed reclamation?

A.—Yes. What was the page in this little book where your last quotation was from?

Q.—I am reading now from a big volume entitled, "The Back Bay Reclamation Scheme," page 65. I am reading from the volume of correspondence. It is the memorandum of the 16th December, 1922, signed by yourself, of a meeting in the Chief Engineer's office. Paragraph 3 says this: "The general question of dredging was discussed. It was agreed that if sufficient first-class material could be obtained from Back Bay without undue risk to the pipe-lines and dredgers, it would be better to use it rather than the mud and clay from the harbour. There was, however, no indication at present that large quantities could be obtained from Back Bay, and therefore the plan must be proceeded with to use the harbour material. Mr. Halcrow suggested the dredger 'Sir George Lloyd' be commissioned and the first pipe-line laid, but only a small area now practically ready at the 'Colaba' end of the reclamation: The plant would be ready in three months and leave two months for experimental pumping." "Experimental pumping" means not merely getting the crew into condition, but it means experimenting as regards the nature of the material that you would be dealing with, does it not?

A.—No.

Q.—Surely it must. Look at the few lines above? The proposal before you was to go into Back Bay and have nothing to do with the harbour?

A.—Yes.

Q.—The reason was that the material in the harbour had been unfavourably reported on?

A.—Yes.

Q.—Mr. Halcrow then says: " Well, get the ' Lloyd ' into commission, and have two months' experimental pumping?

A.—Yes.

Q.—Was not that to find out what sort of stuff you would pump?

A.—It was not to find out whether the dredger could pump the material.

Q.—Was not it to find out the kind of material which constituted the bed of the sea?

A.—Well, yes, taking it in that way, I suppose it was.

Q.—There had been a statement made by Mr. Lewis that a Mr. Mitchell had reported very unfavourably on the stuff in the harbour?

A.—Yes.

Q.—One of the purposes of this meeting of December, 1922, was to discuss what was to be done about the dredging?

A.—Yes.

Q.—Mr. Halcrow put forward the suggestion that the ' Lloyd ' should be commissioned, and you should try to find out in two months what the material really consisted of. " This was considered to be pressing things too much, and Sir Lawless Hepper again asked Mr. Lewis if he could not fix up his barge with a crane and grab which were dismantled some weeks ago to make tests, as Mr. McMurray had received information that the new grab dredger was not likely to arrive before April. Mr. Lewis promised to see what could be done, but did not think he could grab deeper than 15 feet deep in the sea bed. This, however, would give samples of the least suitable material." Anyhow, is it fair to say that in December, 1922, neither you nor Mr. Halcrow, nor Mr. Lewis, nor Sir Lawless Hepper, nor anyone was able to say what was the nature of the sea bed which it was proposed to dredge?

A.—No, I would not say that at all. I should say that we knew the nature of the material, but we did not know how it would dry out. May I explain a little about this phrase " stiff and unctuous clay "?

Q.—I will just finish this. You will have every opportunity at any time you want to make any statement you please. We want all the help you can give us.

A.—My point is there is a complete misunderstanding between us on the subject of the material in the harbour.

Q.—Then page 32 of this little book contains another reference in your reports. I am just giving you the references to the various mentions of material in your reports: " It was an agreeable surprise to see that what was being pumped consisted largely of a hard, compact clay with which we had reason to be quite satisfied "?

A.—Yes. As a matter of fact later on we were not satisfied with it, but that is another point.

Q.—True. Then the next passage is at page 37: " The ' Sir George Lloyd ' and ' Colaba ' were designed to discharge 2,000 cubic yards of soft clay per hour through 10,000 feet of 42-inch pipes. Last season the material actually dealt with was not soft clay, but silt and stiff clay, with some sand and stones "?

A.—Yes.

Q.—Does not that point to the fact that you met material of an unexpected character?

A.—No. In the light of experience we ascertained that the dredger was dredging too deep. She ought not to have gone down where she was.

Q.—" Which, although much better than soft clay from the point of view of suitable material for reclamation, is heavier and more difficult to pass through the pipe-line "?

A.—Yes.

Q.—" Until considerably more work has been done, it is impossible to say of what the bulk of the material to be dredged would consist." That was in 1924?

A.—Yes.

Q.—Is not that a definite statement that even then it was impossible for you to say what the bulk of the material to be dredged would consist of?

A.—No; we knew that the material was soft silt, and what is known as stiff unctuous clay, but we did not know how much soft clay we would get or how much stiff unctuous clay. We knew that we should get ample material, either soft clay or stiff unctuous clay. We knew that we should not have to dig down into the hard stones and clay. A

large portion of the area that Mr. Kidd had proposed, where there was more stiff unctuous clay than silt, had been taken away from us, and we did not know how much stiff, unctuous clay we were going to get, or how much soft silt. Mr. Kidd in his report had said either the silt or the clay is suitable for reclamation purposes, but that the clay was better than the silt. Very well then. We found we could not get as much of the clay as of the silt. The whole discussion was with reference to the quality of the silt for making land, not in any way connected with the capacity of the dredger for dredging it. Shall I now read my notes?

Q.—Let me just finish this passage. You say: " Until considerably more work has been done it is impossible to say of what the bulk of the material to be dredged will consist "?

A.—Yes.

Q.—That is your report?

A.—Yes.

Q.—" But I think it is safe to assume that we shall not get to the full output of 2,000 cubic yards per hour, and that fact must be faced. If we get two -thirds of the estimated total output, we shall be doing well; but naturally the time required to complete the work, and the cost of the pumping, will be increased "?

A.—Yes; that was at a certain date; but in the light of experience we do not say that now. In the light of experience we shall neglect this. We say: Do not go digging away in this heavy stuff. It makes a very good filling but you can get any amount of filling higher up without going down into the clay and sand and stones.

Q.—Where have you ever said that? I do not recognise that as having been said in any instructions which you sent?

A.—Yes; we have repeated the instruction latterly. This was about the very beginning of the dredging operations. I was only in Bombay during two dredging seasons, and then only for a short time, but we have considerably more experience now than we had then. Our latest instructions to people in charge of the dredgers was that they were not to go ignorantly and stupidly digging into the hard ground. We said if they got into the hard ground—and, of course, we know that there is hard ground below the stiff unctuous clay, they should at once lift the ladder and go anywhere round about where there are millions of yards of suitable material. Our point now is in the light of experience there is all the material—in fact, the material is ideal—for filling the reclamation and the dredger is suitable. We are satisfied on these two points: (1) that the dredger can dredge the material; (2) there is the material. That is in the light of our experience to-day.

Q.—Can she dredge the material at a uniform rate of 2,000 cubic yards per hour?

A.—Well, I have not been out there recently.

Q.—What is your opinion?

A.—I should say, yes.

Q.—Then in December, 1924, you were saying: " I think it is safe to assume that we shall not get to the full output of 2,000 cubic yards per hour, and that fact must be faced."

A.—Yes. Now in the light of experience we think that this soft silt which has been so much talked of can make suitable reclamation, and we are not going to dredge this heavy material. We should leave it alone. If you were to use your dredger on anything at all except this bottom layer of clay and stones, the dredger cuts it all right but naturally it is heavier material and you would not get your 2,000 cubic yards. But we shall not do it. If you keep to where there is suitable material then you can dredge as much as you like.

Mr. Billimoria.—Where do you say, " Do not do it "? Is there any letter or correspondence or document in which you say that?

A.—Yes, there are documents on the subject—I think I can produce them—in which we have said, " Lift your ladder and do not go messing about there."

Q.—Dated 1926?

A.—Well, I can produce the letters.*

Mr. Billimoria.—If you please.

The Chairman.—For the moment we are discussing the harbour, are we not?

A.—We are discussing the harbour; we are not discussing Back Bay.

Q.—That is right. I want to put a figure or two to you. In December, 1924, as you were saying, you thought it safe to assume that you would not get the full output of 2,000 cubic yards an hour, and the dredging would be going on well if you got two-thirds of that output?

A.—Yes.

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* See Appendix V.

Q.—In fact, the history is, is it not, that in the first season she began operations on the 8th December, 1923?

A.—I will take that.

Q.—And throughout that season she did an average pumping of 1,020 cubic yards per hour. You have seen the figures?

A.—I have seen the figures, but really I take with great reluctance any figures which have been produced in Bombay.

Q.—Will you repeat that answer?

A.—Really I take with great reluctance any figures which have been produced in Bombay. In reading this evidence I am quite sceptical about any figures which have been produced for the Committee in Bombay.

Q.—At all events, the figures produced before us in Bombay are vouched for by Sir Lawless Hepper, Mr. Lewis and Mr. Elgee, and a number of other witnesses, and point to the fact that the " Sir George Lloyd " dredged 1,020 cubic yards per pumping hour during the season 1923-1924?

A.—Yes.

Q.—That during the season 1924-1925 she did 856 cubic yards per pumping hour, which is a considerable drop, and during the season of 1925-1926 she did 959 yards. Those three figures give an average of 941 cubic yards per hour, which is less than 50 per cent. of her output?

A.—Assuming those figures are correct, you mean?

Q.—Yes.

A.—Assuming they are correct, it does not necessarily imply that there was anything the matter with the dredger. Supposing you went to the Motor Show and brought a Rolls-Royce car, and you took it home, and we will suppose that not you but anyone handed it over to your wife who had only driven a Ford, and she went out with the Rolls-Royce and she could not get speed or anything out of it : you could hardly blame the Rolls-Royce Company if there was a complaint. I maintain that the dredger has never been worked.

Q.—Let us see how that analogy holds. You say a man buys a Rolls-Royce, and hands it over to his wife who had never driven anything but a Ford. Did you nominate Mr. Lewis as the engineer?

A. I did nominate Mr. Lewis.

Q.—Had you complete confidence in Mr. Lewis when you nominated him?

A.—I had complete confidence in him when I nominated him.

Q.—Did you nominate Mr. Speirs as dredging master, or did you get Simons & Co. to nominate him?

A.—I did.

Q.—Had you complete confidence in Mr. Speirs?

A.—At that time I had complete confidence in him.

Q.—He was a very good man?

A.—Yes.

Q.—Did you nominate Mr. Brims?

A.—I nominated Mr. Brims.

Q.—And approved of, and quite rightly pressed the appointment later on of Mr. Elgee?

A.—That is quite true.

Q.—I am trying to work out your analogy.

A.—But I did not nominate Sir Lawless Hepper.

Q.—But Sir Lawless Hepper did not work the dredger, did he?

A.—No.

Q.—Taking the actual conduct of the work, first of all there was Mr. Lewis, who should be the driving force, and secondly there was Mr. Speirs, the dredging master, and the crew?

A.—Yes.

Q.—With confidence in the dredging master and confidence in Mr. Lewis, ought not the dredging people to have got a better result than less than 50 per cent.?

A.—I do not think so. They did not work 24 hours a day, for one thing. Mr. Brims went out with orders to work 24 hours a day. They could not get their staff.

Q.—The point we were on was the quality of the material?

A.—Yes.

Q.—As to whether right the way down to December, 1924, nobody, neither you, Mr. Halcrow, Sir Lawless Hepper, Mr. Brims, Mr. Speirs, nor anybody, knew really what the dredger was going to come up against as soon as the dredger began to work?

A.—No. I beg your pardon. We knew what the material was, but we did not know how it was going to dry out. Perhaps I had better read my notes now on clay.

Q.—Do, please. It is not contained in your statement I understand?
A.—No, but I will give it to you.

Q.—Will you read it?

A.—" There has been so much talk during this inquiry about soft clay, stiff and unctuous clay and hard clay, and the unsuitability of the dredger for the material being dredged in the harbour, that one really gets on reading the evidence a little bewildered. I obtained such information as I possibly could about this material before I specified the dredger for soft clay. I had frequently been over the Sewri Reclamation with Mr. Messent, the late Chief Engineer of the Port Trust. I had also inspected the Bombay Dock works when under construction. I had to make use of land at Sewri, and personally examined it in connection with storing materials. I had frequently discussed reclamation works with Mr. Messent off and on for years past, and he was a friend of mine of 30 years' standing. From all the information I could obtain I diagnosed the material as soft, and I maintain that that is a correct diagnosis. I was, indeed, really rather surprised at Mr. Kidd, with his knowledge of the material, going to the extent of taking such a large number of borings. The very way in which the borings were taken satisfied me that there was at all events no hard rock or moorum above a certain level. Our great trouble and apprehension in Bombay was that we should not get enough of the stiff, unctuous clay, and would have to be content with the silt overlying the clay—we knew that there was silt, and we knew that there was clay. Mr. Kidd had said that both the silt and the clay were suitable for reclamation purposes. The Port Trust and the Indian Marine had deprived us of dredging over a large area where Mr. Kidd's borings had proved there was clay in abundance. The question which exercised my mind and the mind of the engineers in Bombay more than any other was whether this silt above the clay would dry out satisfactorily. A Mr. Mitchell in Bombay had given most pessimistic accounts of the time the material would take to dry out, and I began to be anxious whether, in the absence of the stiff unctuous clay, the silt would really be serviceable. My reason for advocating a test of the material and asking Mr. Lewis to borrow a dredger for experimental purposes was solely based upon this fact and had nothing whatever to do with the suitability of the material for dredging. Mr. Lewis obtained some of the silt and clay and deposited it within a small enclosed area. I carefully examined it on my return to Bombay before the dredging operations started. It seemed to me to dry out well, and I was quite satisfied; but Mr. Mitchell the pessimist came along and told us that the first rains would reduce it to a semi-liquid condition. When the dredger actually started work we were very pleased with the result. The material was clay and stones and sand, which was dealt with quite well by the dredger, and hardened out so quickly that in a couple of days the reclaimed ground could be walked over. The material was most excellent for reclamation purposes, and it was being well cut by the dredger, but it was not the stiff unctuous clay, and quite obviously, if there was nothing but this clay, sand and stones, although it made most excellent material for reclamation, you would not get the same output out of the dredger as you would with stiff unctuous clay. In the light of experience we came to the conclusion that this clay and stones and sand, which were the bottom strata, should be left alone, and it would be preferable, as soon as that was reached, to raise the ladder of the dredger and move on to the silt and clay. In fact, the complaint in one of our letters that the dredger was dredging in unsuitable material was with reference to the fixed determination of the dredging staff to work in stones, sand and clay when there was an abundance of other and more suitable material available.

Q.—What date is that letter; have we got it?
A.—I can give you the date; it is quoted.

Q.—Is it quoted in your statement?
A.—I think it is in my statement, but I can give you the date of it.

Q.—Is there any letter in which you tell them that they are working too deep?
A.—There is, and we can produce that.*

Q.—You will let me have that later?

A.—Yes. It has been stated that I used the words " hard clay " several times in my report; but when one writes one does not do so with the idea that words will be examined years afterwards with a microscope; if that were the case everyone would cease writing altogether. I knew the clay was not hard in a dictionary sense of the term—unyielding to the touch, solid. I used the term in reference to and in comparison with soft silt which did not harden at once on being deposited and in which a man would sink to his middle. In my report dated 14th February, 1924, I said: " I believe that the result up to date has been quite satisfactory; the material in the harbour had proved much harder than we were led to suppose, and the actual reclaimed land can be seen and walked upon by anyone who chooses to go to Colaba. The word " harder " obviously

* See Appendix V.

refers to the quality of the reclaimed land. Further, whatever I said or did not say we know for a fact that the clay is not hard clay. That was also stated definitely by Mr. Kidd in his evidence, with which I concur. If I may I should now like to come to the suitability of the dredger " Sir George Lloyd " which was designed for soft clay, to cut a stiff unctuous clay which Mr. Kidd assumes was in abundance. Mr. Kidd in his evidence said that he had satisfied himself that this stiff and unctuous blue clay is the same all over the harbour. He also said that the dredger " Jinga," the Port Trust dredger, had her best figure of output when she was working for the most part in blue clay, and he says that he was an eye witness of the successful cutting of the stiff unctuous blue clay at the Sewri reclamation when the " Jinga " working in blue clay discharged through 3,465 feet of pipeline at the rate of 1,480 cubic yards per hour. Now it is worthy of note that the dredger " Jinga " which did so extraordinarily well in this stiff unctuous clay was designed to work in soft clay. The " Sir George Lloyd " was also designed to work in soft clay, and has, I understand, the same cutter as that in use on the " Jinga." It seems to follow that if the " Jinga " did such excellent work in this stiff and unctuous blue clay, there is no reason why the " Sir George Lloyd " should not follow suit. Mr. Kidd also says in his evidence that he is satisfied that the material is available in sufficient quantity in the harbour, and that dependence can be placed upon the surveys made in 1912 for dredging in 1919, and that he is perfectly convinced that reclamation can be done to-day more cheaply by dredgers properly worked than by any other method. I concur entirely with Mr. Kidd in these conclusions. Mr. Kidd also had some interesting remarks to make on the magical effect of a bonus, and he relates how when he operated the Port Trust dredger for his own purposes he got outputs very much in excess of the very best outputs that had ever been obtained in the Port Trust operations, and he attributed these results solely to the fact that he had paid the crew a bonus on results. Personally, I have not the slightest doubt that the dredger is designed for soft clay which is the same as stiff and unctuous blue clay. I am satisfied that there is an abundance of material—that in the light of all the experience we have now got—in the harbour for reclamation purposes; but I am quite certain that under the existing organisation you will never get the output from the dredger.

Q.—I will return a little later to that; but your view as expressed here that the dredger is correctly designed for soft clay or stiff unctuous clay is in direct opposition to Mr. McMurray, is it not?

A.—I have never studied Mr. McMurray's evidence.

Q.—It is worth while looking at it. It will repay study.

A.—Mr. McMurray said that the dredger was designed for soft clay?

Q.—I will read you the extracts a little later, but I want to take this in passing. Is it not also in opposition to Sir John Biles' view?

A.—Sir John Biles was never in Bombay. I do not know what Sir John Biles said, but he was not out in Bombay.

Q.—Have you looked at his evidence?

A.—I cannot say that I have read the evidence. I have glanced at it.

Chairman.—I will refer a little later to the passages.

Sir Harry Courthope Munroe.—I have a supplemental statement which was got out last night which has a few additions to the statement you have already had.

A.—I have not got a copy of that. These are only some notes which I made for myself which I thought might be useful in the course of the examination, and naturally I will hand them in from time to time.

Chairman.—Going back to your statement, you speak of the letter of the 23rd May, 1919, but I think you omitted from your statement a passage of importance, namely, the statement: " That the best dredgers in the world were made by one or other of four firms in the Clyde district." Do you remember that?

A.—Probably. I agree to that.

Q.—One of the firms that you had in your mind would be Messrs. Simons?

A.—Yes.

Q.—Mr. McMurray is their London representative?

A.—Yes.

Q.—And a partner?

A.—I do not know what his position is.

Q.—Is he a man who has a very good knowledge of dredgers?

A.—Yes; he has as good a knowledge of dredgers as any man.

Q.—Sir John Biles said in his evidence that there were very few people who would pit their opinion against that of Messrs. Simons. Is that about right?

A.—For the particular type of dredger?

Q.—In dredging matters?

A.—No; for a particular type of dredger.

Q.—I think he said it generally—that generally Messrs. Simons were a firm whom very few people would care to pit their opinion against, meaning that Messrs. Simons as dredger-builders were people of eminence, experience and good judgment.

A.—Yes.

Q.—Do you agree with that?

A.—I agree with that.

Q.—There is a letter to which I must refer of the 25th of May from the Governor of Bombay to Sir George Buchanan. It is an important letter. It is quite short. Have you got the original here?

A.—Is that in my statement?

Q.—No; you do not mention it. I can summarise it and recall it to your recollection. We have had it read in evidence. It is a letter in which Sir George Lloyd said that he wanted you to tell him whether the project was feasible and whether prices made it a reasonable proposition, and that if you said it was not, he would abandon all idea of that project and turn to something else. Do you remember that?

A.—Excuse me; I think that was an interview. I do not think that was a letter.

Q.—I assure you it was a letter. I will find it in Lord Lloyd's evidence. I want to bring that out because it has been said that Lord Lloyd was definitely committed to the scheme, and that nothing would push him away from it. That letter ought to come out in fairness to Lord Lloyd, and you ought to express some opinion about that letter.

A.—Well, the gist of the letter, such as it is, is given in my statement at page 29.

Q.—I must read the letter. You may take it that there was a letter of the 25th May, 1919, in which Lord Lloyd told you that if you advised against it he would finally abandon the whole thing and would turn to some other project without another ten days' discussion. Does that recall it to you?

A.—I do not remember the letter. I remember the interview, because at page 29 of my note I have said: "On the 28th May, 1919, I had an interview with Sir George Lloyd. Sir George Lloyd discussed with me my terms of reference, asked me a number of questions, and said that the Back Bay scheme had for years past impeded progress in Bombay." He would give me his entire and absolute confidence, and if I said the scheme was impracticable he would turn it down at once and start on something fresh; but once my opinion was given he would refuse to allow any other expert to report; and he asked me not to let him down. That was the interview, but I do not remember the letter.

Q.—We have had the letter, and I will find it. That interview, when he asked you not to let him down, satisfied you that you had his full confidence, did it not?

A.—Certainly.

Q.—His full confidence?

A.—Yes.

Q.—If you wrote a report saying: "This is a feasible scheme. This can be done at such-and-such a price," you knew that Lord Lloyd would accept that as decisive and final and go ahead with the scheme?

A.—Yes.

(Adjourned for a short time.)

Chairman.—The letter which I mentioned before the adjournment is dated 25th May, 1919, and is in reply to your letter of the 23rd, which you have set out in part at page 29 of your statement: "My dear Sir George. Thank you for your letter of May 23rd. I should wish to leave the date of your departure entirely to your own discretion, and if you think that the enquiries and final report which I am asking you to undertake will be hastened rather than delayed by your getting to England at once, please make plans accordingly. All I am anxious for is to know as early as possible whether a Back Bay scheme is feasible, and, on present prices, is a desirable enterprise. If not to abandon it finally and turn our energies in other directions, or if it is found practicable to get on with the job without another ten days' discussion. I shall hope to see you on Wednesday next and discuss the matter fully with you." Do you recollect that letter?

A.—I seem to recollect that letter, but I do not seem to have got it among my papers.

Q.—It is an extremely business-like letter, is it not?

A.—Yes.

Q.—It goes to the two points—whether the scheme was feasible, and, on present prices, a desirable enterprise. It really follows out what you had said a little time before

when you had taken the two points up—whether it was practicable, and practicable at the prices then ruling?

A.—Yes.

Q.—Then he says " If not to abandon it finally "?

A.—Yes.

Q.—Do you read that letter as an indication that Lord Lloyd at this date, 25th May, 1919, was not in any way pledged to the carrying through of the Back Bay scheme?

A.—I do.

Q.—That if you had advised against it that would have been absolutely final, and, as he says, he would have turned his energies into other directions?

A.—Yes.

Q.—He says he wants to get on with the job without another ten days' discussion?

A.—Yes.

Q.—He may have had in his mind Mr. Rudyard Kipling's lines, that " the more we work and the less we talk the better results we shall get." It is not a bad working rule in life, even with Committees, is it, Sir George?

A.—I agree, Mr. Chairman.

Q.—Now, you concluded just before the adjournment by referring us to the substance of your interview with Lord Lloyd on the 28th May, 1919?

A.—Yes.

Q.—In which he places himself entirely in your hands and asked you not to let him down?

A.—Yes.

Q.—In writing a report the duty, of course, of every professional man is to put the pros of the scheme and the cons of the scheme fairly forward?

A.—Yes.

Q.—You set out whatever advantages you conceive the scheme has, and equally you must set out in full prominence the disadvantages. Is that so?

A.—Yes.

Q.—And the difficulties?

A.—Yes.

Q.—And the uncertainties?

A.—Yes, the uncertainties.

Q.—Of course, neither Sir George Lloyd nor Mr. Curtis, or anybody in Bombay, would be likely to be aware of the immense technical difficulties?

A.—No; if I may interpose a few words here, Mr. Chairman, I was not initiating a scheme which had not been previously considered. I was examining and reporting on a scheme which had already been accepted by the Government of Bombay, and which they had sent up to the Government of India for sanction, about which they said they had absolutely no doubt.

Q.—True. At the same time they were referring the matter to you as the final authoritative expert, were they not?

A.—Well, my terms of reference——

Q.—Wait a moment. Were not they referring the matter to you as the final authoritative expert?

A.—Yes.

Q.—In Lord Lloyd's own letter he makes it clear to you that if you pronounce against it he will turn his energies into other directions?

A.—Yes.

Q.—Will you continue?

A.—I agree, Mr. Chairman. I would again emphasise that I was not initiating a scheme which had not been considered before. I was examining and reporting on a scheme which had already been accepted by the Government of Bombay in terms, really, which you would have though might even have convinced the Government of India, but they did not.

Q.—That is putting the position quite exactly; that is right. It was because the Government of India were still unconvinced that they said " Let us have someone on whose decision we can rely "?

A.—Yes, but were not the Government of India unconvinced more especially on financial grounds?

Q.—In a moment we will come to the terms of reference and have a look at them. Did you, at the interview of 28th May, page 29, or at any other interview, tell Lord

Lloyd that the nature of the material could only be ascertained when the dredger actually began to work?

A.—No.

Q.—You must have known that, must you not, when you went to the interview?

A.—No.

Q.—Let us see what information you had. This was 28th May—two days before you were leaving for England?

A.—Yes.

Q.—By that time you had concluded your enquiries?

A.—Yes.

Q.—You had, of course, read Mr. Kidd's report at that time?

A.—Yes.

Q.—And you had seen his description of the clay?

A.—Yes.

Q.—You had seen that he had taken 1,314 borings and had recorded 1,159?

A.—Yes.

Q.—And you had seen plan No. 5?

A.—Yes.

Q.—What information had you between 28th May, 1919, and February, 1922, which led you, in February 1922, to say that the nature of the material to be dredged could only be ascertained when the dredger began to work? What had happened in the interval?

A.—The only thing that had happened in the interval was that Mr. Mitchell had expressed the opinion that this silt would not dry out. There was never any question as to whether the dredger would dredge the material or not. It was nothing to do with the dredger. When the Indian Marine and the Port Trust deprived us of a large area of land, we were left with a superfluity of silt, and the question arose whether this silt would dry out and make satisfactory filling. We now think that it will, but there were insistent statements in Bombay that this stuff would remain always in a semi-fluid condition, that it would not make good filling. I used to go down and look at the Sewri reclamation and examine that.

Q.—But did not the Sewri reclamation come to an end in 1913?

A.—The Sewri reclamation came to an end in 1913, but the land was still there.

Q.—The reclaimed area?

A.—Yes.

Q.—On plan No. 5 recording the 1,100 borings there are in each circle three sets of figures, are there not?

A.—Yes.

Q.—One is the silt?

A.—One is the silt.

Q.—So that a study of plan No. 5, if Mr. Kidd's borings were correct, would show you exactly the quantity of superimposed silt with which you had to deal?

A.—Yes.

Q.—When did you first begin to be uncomfortable about the silt as a possible material for reclamation?

A.—We have to go farther on into the statement for that.

Q.—Can you just indicate it to me, and I will pass away from it?

A.—On page 97 of the statement you will find there is correspondence initiated by Mr. Lewis.

Q.—That Mr. Mitchell had reported adversely?

A.—Yes.

Q.—On the 12th May, 1921, you write to Mr. Lewis " Mitchell's poor opinion of the material for reclamation is certainly disconcerting, but it cannot be any worse than the material used at Sewri "?

A.—Yes.

Q.—So that by the 12th May, 1921, you were disconcerted by Mr. Mitchell's opinion?

A.—I was disconcerted by Mr. Mitchell's opinion about the silt.

Q.—We are on silt now, Sir George. Ought it not to have occurred to you—or might it not have occurred to you—when you were studying Mr. Kidd's plan No. 5, that you would have a great deal of silt to deal with before you got at the clay?

A.—Yes, but we were going to put the silt at the bottom and the clay at the top.

Q.—Quite true. Therefore you did regard, in 1919, the silt as a material worth dredging?

A.—Yes.

Q.—It had to be dredged. You could not get to the clay?

A.—It had to be dredged, but in the light of events we are now quite satisfied with the silt.

Q.—You mean since the sealing of the sea wall?

A.—Not necessarily since the sealing of the sea wall. We will bring evidence later on.

Q. Are we going to have the pleasure of seeing Mr. Halcrow?

A.—Mr. Halcrow and Mr. Settle.

Q.—So be it. The first season's dredging, for some reason or other, was said to give an output of 1,020 cubic yards per hour instead of 2,000, and that matter was brought to your attention, was it not?

A.—Yes. Well, as I say, I do not accept any of these figures, but we will take them.

Q.—At all events let us put it generally. Was it brought to your attention that the output of the dredger in the season from 8th December, 1923, to April or May, 1924, was very disappointing?

A.—It was, yes.

Q.—Did you tell Mr. Cowasji Jehangir, Sir Lawless Hepper, and other gentlemen, that the first season's working must always be regarded as experimental?

A.—It depends on what you call experimental.

Q.—I am asking you first of all the question, did you in fact tell Mr. Cowasji Jehangir, Sir Lawless Hepper, Sir Leslie Wilson, the present Governor of Bombay, and other gentlemen, that the first season's dredging must always be regarded as experimental? You can explain afterwards.

A.—Yes, I will agree to that.

Q.—That being so, that was a fact which, of course, you would have known on 28th May, 1919, when you had the interview with Lord Lloyd. It was not a new fact to you?

A.—No.

Q.—Did you tell Lord Lloyd that the first season's working must be regarded as experimental?

A.—No.

Q.—Did you tell him that the cost of the dredging and filling must be an uncertain quantity until you had had actual experience?

A.—No, I did not think it would be an uncertain quantity.

Q.—Did you not? You thought it even as late as 1924, did you not? Look at page 39: "So far as I can see Mr. Lewis's figures are generally acceptable, except that the cost of dredging and filling must be an uncertain quantity until we have had experience of this season's work"?

A.—Yes. By "uncertain quantity," you have to take into consideration the hours of working and—well, everything connected with the working of the dredger.

Q.—Your estimate in your report of October gave the figure of eight annas per cubic yard, did it not?

A.—Yes.

Q.—That was an all-in figure for supplying the plant, supplying the dredger, the booster, the pipe lines. reconditioning of vessels, engagement and payment of crew?

A.—Yes.

Q.—All the operations necessary to dredge the silt and clay from the harbour, transport it across the peninsula and put it on the reclamation?

A.—Yes.

Q.—And I think in your report you expressed yourself as confident that your figures could be relied upon?

A.—Yes, I think they were based on reliable data.

Q.—How was it, if you were confident in October, 1919, that the figure for dredging and filling was eight annas a cubic yard, you were found saying in 1924 that the cost of dredging and filling must be an uncertain quantity?

A.—Because I was not so confident of the general arrangements. We were not working 24 hours a day.

Q.- As regards 24 hours a day, you never recommended that in your report, did you, Sir George?

A.—Not in my report, but when Mr. Brims went out, he went out with instructions to work 24 hours a day. He gave it in his evidence.

Q.—One of the matters that would always give a reduced output in the first year would be the necessity of training the crews, would it not?

A.—Yes. It would depend on whether you could get trained crews.

Q.—Anyhow, it is one of the uncertainties. You might be able to get a trained crew; on the other hand, you might have to train the crew?

A.—Yes, you might have to train your crew.

Q.—Was that a matter which you mentioned to Lord Lloyd at all as one of the uncertainties that might reduce the output in the first year?

A.—I did not discuss with Lord Lloyd all the contingencies that might possibly arise. I thought that the dredger was a practicable proposition. I still think, with proper working, it is and should always have been a practicable proposition.

Q.—With regard to these matters which I have mentioned——

A.—May I just interpose one remark here? When I went out to Bombay in the first year of the dredging, I found one man at work on the dredger. I said, " What is going to happen if that man falls sick? "

Q.—You mean Mr. Speirs?

A.—I was told, " Well, the dredger will have to stop work if that man goes sick." Surely that is an uncertainty? If you have all these uncertainties, what are you going to do about your prices, or anything else? That was the beginning of the dredging season.

Q.—That was December, 1923?

A.—Yes.

Q.—In your capacity as expert adviser, and supervisor of the work, did you make any representation to anyone with regard to that?

A.—I constantly made representations.

Q.—On that one point?

A.—Certainly I did, on that one point.

Q.—You wanted an assistant dredging master out, did you not?

A.—Yes.

Q.—And did they, in fact, get one?

A.—In fact they did get one.

Q.—The first year's working anyhow, must have been a failure, must it not?

A.—No. I do not see why it should have been a failure.

Q.—Do you not? They were only working one shift?

A.—From that point of view, certainly.

Q.—The first season's working must have given a very reduced output. Let us put it in that way?

A.—Yes, certainly, only working one shift.

Q.—I think the committee would very much like to know from you whether when you found one shift working, you discussed this matter with Sir Lawless Hepper, and said " You must get a second shift on at once." What did you do with regard to it? You see the position is this,is it not.? Sir Lawless Hepper has disclaimed any technical knowledge. He says " I was a mere administrative head." You were on the spot. You were seeing that there was only one shift, contrary to your advice. What did you do to force them to get a second shift trained?

A.—I was always faced with a *non possumus*. Certainly I discussed it with the dredging superintendent. Certainly I discussed it with Sir Lawless Hepper, but, as I say, we were always faced with a *non possumus*.

Q.—That puzzles me a little. You will forgive my trying to get at this. We want your help about it. You see you said in your report " This reclamation will be done in this manner."

A.—Yes.

Q.—" The dredger will pump 2,000 cubic yards per hour for 15 hours a day for 170 days of the working season working double shift."

A.—Yes.

Q.—The whole essence of the thing depended on double shift, did it not, according to you?

A.—Yes.

Q.—On at least double shift?

A.—Yes.

Q.—You went out there. You were the man whom Lord Lloyd said would, it was fairly obvious, be selected. Whatever you had said would have had to be obeyed I should have thought?

A.—Oh, no, Mr. Chairman.

Q.—Let us hear what difficulties you had in the matter. If you had said to Sir Lawless Hepper " You must get a double shift trained at once " and if Sir Lawless

Hepper had raised difficulties, ought not you to have told the Government of Bombay that you could not remain as engineer to the works?

A.—Yes, I might have resigned, certainly. But I was not carrying out——

Q.—Would not the slightest hint of your resignation have made everybody in Bombay do anything you wanted them to do?

A.—No, Mr. Chairman, I do not agree with that at all.

Q.—What would have been the position of Sir Lawless Hepper, who had assumed office on the strength of your report that the dredger was to work double shift, if he had said " Oh, we cannot get a double shift." ? He would have had to have got it, would he not?

A.—No, he would have said he could not get it.

Q.—Very well.

A.—I would like to produce the various letters in which we have urged them to get it.

Q.—Are they in your statement?

A.—I am not certain whether they are in my statement, but there are letters in which we have said " Will you get a double shift "? In the second year's dredging we sent out a cablegram saying " We must have a double shift, have you got the staff? "

Q.—But that was the second year?

A.—Never mind. The chief engineer replied, forwarding five references which he had made to the Development Department, to which he had had no reply at all, and in which he had asked that arrangements should be made.

Q.—I do not think we have got that correspondence?

A.—I will see that you have it.*

Q.—Thank you very much. We have just touched on the question of the first year's working being experimental, and on the reduced output owing to the possibility of having to train a crew, and matters of that kind. Are any of those difficulties indicated in your report?

A.—In my report of 1919?

Q.—Yes?

A.—No. You do not in a report indicate every possible contingency or difficulty which you may come across in the course of working. You cannot possibly know a lot of them.

Q.—But surely the object of an expert is that he should have had experience of similar works, and that he should know these things?

A.—It is admitted that this is the largest dredging proposition that has ever been done. Naturally, from time to time you would be up against new contingencies. It was not like building a house. You cannot foresee everything. You cannot foresee every small thing which is going to happen.

Q.—I am only on the broad things. You must have known in 1919, when you were writing your report, that the first season's work was likely to be experimental. Indeed, I think you have told us so. Ought not it to have been put in the report—just a passage saying something like this: " In all these big enterprises unexpected matters occur. For instance, the first season's working may be largely experimental because of the fact that we may be only able to get an untrained crew; we are not aware of the strength of the tides and many other difficulties,"—something of that sort?

A.—I can see circumstances where it would not have been experimental, where the dredger would probably have done most excellent work for the whole of the season. I admit that under the circumstances which existed in Bombay the dredger did not do the full output, but I do not admit that those were normal circumstances. I say that under other circumstances with competent and energetic men, they would have got additional output. I say, on page 116 of my statement: " Mr. Merritt, the assistant dredging master of the dredger ' Sir George Lloyd,' in the course of his evidence summed up the situation admirably. When asked in what respects the dredging in Bombay differed from work done elsewhere he replied: ' One is run by a private company, and they want their pound of flesh. If you do not turn over the percentage you have to make room for someone else.' " Under other circumstances, with a bonus on output and continuous working, those dredgers would undoubtely at all events have come up to such an output that there would have been no complaint about them.

Q.—I will return to that when we are dealing with the character of the material. Going back to page 29 of your statement, on the 29th May you wrote to the Joint Secretary of the Government of Bombay, Public Works Department, as follows: " With respect to the proposal to obtain my professional opinion and advice on what is know as the Back Bay Reclamation Scheme, I have read the terms of reference, and beg to reply as follows. I have examined the site on several occasions, and have satisfied myself that the survey and borings made by Mr. Kidd are sufficient to enable me to write my report." How had you satisfied yourself that the surveys and borings were sufficient?

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* See Appendix VI.

A.—I do not think you ought to read those together, Mr. Chairman. I have examined the site on several occasions. I have been all over the site. By saying that I had satisfied myself about the survey and borings made by Mr. Kidd I did not mean that I took any borings. I had satisfied myself because I had got his.

Q.—I accept that interpretation of it. " By satisfying yourself " you meant, " I am satisfied in my own mind "?

A.—I am satisfied in my own mind.

Mr. Billimoria.—Is that the impression which an ordinary reader of that letter would get, Sir George—that it was in your mind that you were satisfied?

A.—We do not always write letters with a view to people being impressed with them later on.

Chairman.—I think, Mr. Billimoria, that is a reasonable interpretation.

A.—" I have examined the site on several occasions, and have satisfied myself about the survey and borings."

Q.—We have now arrived at the point when you had received Mr. Kidd's estimate of 1912?

A.—Yes.

Q.—You notice that on page 2 of that report he says: " The clay which is stiff and unctuous hardened into perfectly solid ground in a very short time "?

A.—Yes.

Q.—Stiff clay is one thing and soft clay is another?

A.—Stiff clay——

Q.—Stiff clay is stiff clay?

A.—Stiff clay in this sense is soft clay; it could not be anything but soft clay; it might be stiff and unctuous.

Q.—You say that stiff clay in the passage I have read from Mr. Kidd's report really means soft clay, is that it?

A.—Yes.

Sir Frederick Hopkinson.—And that it cannot be anything else?

A.—It cannot be anything else.

Chairman.—In the passage in your report where you refer to it as hard clay does that mean soft clay?

A.—I dealt with that in the note that I read before lunch.

Q.—Let us see if we can get it right because I have not had an opportunity of reading that carefully. Do you mean then that the phrase in your report, " hard clay," was a mistake, and that you used the wrong adjective?

A.—I used it in a different sense. I used it with reference to the hardness with which it would dry out. I did not use it with reference to the hardness in which it was in the ground.

Q.—You say that you used it with reference to the solidifying properties it would display after being reclaimed?

A.—After being reclaimed. I never for one moment used it with reference to the state in which it was in the ground.

Q.—Let us see about that. The passage in your report is : " The soft mud will form the bottom layer of filling and the hard clay which lies below the mud over the area to be dredged will be superimposed on the clay "?

A.—Yes.

Q.—That is the passage, is it not?

A.—That is the passage.

Q.—Are you quite right when you state that you have never used the phrase " hard clay" with reference to the clay as it was in the bed of the sea?

A.—Quite certain, because I am absolutely certain that it is not hard clay.

Q.—Have you ever described the clay in the bed of the sea as being compact hard material?

A.—Never to my knowledge as hard compact material. Certainly if you go deep enough down into the earth you will find any material, but down to Mr. Kidd's borings there was never anything hard.

Q.—Will you turn to page 32 of document No. 18 : " In forwarding the findings of the Conference to you "—that must have been the meeting of the 9th January?

A.—Yes.

Q.—It says : " At a conference on dredging operations held in the Chief Engineer's office on the 9th January, the following conclusions were arrived at." we can pass over those conclusions.

A.—Yes.

Q.—Then it says: " In forwarding the findings of the conference to you I observed in the covering letter dated 10th January, 1924, that after the grave doubts which had been expressed at various times as to the suitability of the material in the bed of the harbour for reclamation purposes, it was an agreeable surprise to see that what was being pumped consisted largely of a hard compact clay with which we had reason to be quite satisfied." Does not that mean a compact clay because for centuries it had been pressed in on itself?

A.—No, that means, as I explained before lunch, that they were then dredging below the clay on to the hard material. Subsequently we told them that they were not to dredge on to that hard material. If they came across it they were to lift their ladders. May I put it in this way: *There* is the silt, *there* is the clay, and below the clay, as is shewn on all Mr. Kidd's borings, you get to moorum, hard clay, stones, silt. (*The Witness drew a diagram*).

Q.—That is right?

A.—As I tried to explain, that makes most excellent filling. The dredger cut it without any difficulty at all, but you would not get your whole output from it.

Q.—Surely you never anticipated that they were going into the moorum, did you?

A.—We do not want to go into the moorum. We later on told them to go out of the moorum.

Q.—The evidence that they have given is that they never tried to get into the moorum because the moorum was composed of rocks, stones, and all sorts of things. Here clearly at page 32 you are not referring to moorum at all, are you?

A.—Yes.

Q.—" It was an agreeable surprise to see that what was being pumped consisted largely of a hard compact clay with which we had reason to be quite satisfied."

A.—Certainly; it was an agreeable surprise. Here we had been told by the Bombay pessimist that we should get nothing but silt, and that the silt would not dry out, and we saw excellent material coming through the pipes. It was one of their best season's work, but there were stones and sand with it. Later on, as one of my witnesses will tell you, when he went out there we insisted that to get the output they must get up from this and get on to the clay and the silt. I maintain that they were dredging at that time down below Mr. Kidd's silt and clay into the clay stones and silt in which although it is very good for reclamation you do not get your full output.

Q.—If you will take the paper in your hand which you have drafted out, No. 1 we might call the silt?

A.—Yes.

Q.—No. 2 is the clay and No. 3 the moorum?

A.—Yes.

Q.—One layer above the other?

A.—One layer above the other.

Q.—Will yon please read at page 32 and tell me whether the material to which you were referring there, a hard compact clay, did not come out of No. 2 and not out of No. 3?

A.—No, it must have come out of No. 3.

Q.—Why do you say that it must have come out of No. 3?

A.—Because we know the facts of all these borings. Where he took his borings he could not have gone into clay and stones; it must have been No. 3.

Q.—Did you at one time express the hope that there would be a great deal of hard clay to be found in the dredging?

A.—As I say——

Q.—Will you answer the question first. Did you at one time express the hope that there would be a great deal of hard clay found in the dredging?

A.—Very likely I did, but what did I mean by it?

Q.—How was a dredger designed to cut soft clay going to deal with hard clay?

A.—Because the hard clay was with reference to the hardening out. We have got samples of the material, and I still say that the soft clay is the material there, that the dredger was properly designed for soft clay, and that there are millions of cubic yards ready to be dredged. I should like to show you some examples.

Q.—We have one here somewhere. If you have any samples that you would like to show us we should be most happy to see them, not necessarily now, but at any time you like?

A.—Yes, we have got samples.

Q.—Are they as heavy as that sample? (*Sample of hard clay handed.*)

A.—Yes, that is the material below the unctuous blue clay.

Q.—That is what you would say was in compartment No. 3 of your diagram?
A.—Yes, I would say that that was in compartment No. 3.

Q.—Let us keep that in our minds. Compartment No. 1 is silt, compartment No. 2 clay, and compartment No. 3 moorum, rock, stones. Mr. Kidd uses an alternative word for silt. He calls it mud, does he not?
A.—Yes.

Q.—Do you accept that?
A.—You can call it mud, yes.

Q.—It is the recent washing down from the monsoon rains through the rivers, is it not?
A.—Yes. You can call it silt or mud; it is immaterial to me.

Q.—On the 25th July, 1919, which would be when you were half way through your report, you wrote a letter to Mr. McMurray in which you spoke of the material as "clay"?
A.—Yes, as clay.

Q.—A day or two before that, according to Mr. McMurray, you had had an interview with him at which you had discussed the general design of the dredger?
A.—Yes.

Q.—Do you remember that?
A.—Yes.

Q.—Had you told him at any time that the dredger would have to work in material that Mr. Kidd had described as stiff clay?
A.—As stiff unctuous clay.

Q.—Yes.
A.—We did not want any better material than stiff unctuous clay.

Q.—That is not my question. I am asking you whether, at the interview with Mr. McMurray, you said to him, "You have got to build a dredger which will do 2,000 cubic yards per hour in stiff clay"?
A.—We discussed it with Simons & Co. in Glasgow.

Q.—Let us get it by steps. At the first interview with Mr. McMurray you did not tell him that you wanted a dredger that would do 2,000 cubic yards per hour in stiff clay?
A.—No, I did not want to dredge stiff clay.

Q.—I am using Mr. Kidd's phrase?
A.—Yes, but I say Mr. Kidd's stiff unctuous clay and soft clay are the same. Mr. Kidd has told you in evidence that the dredger "Jinga" got a better output in the stiff unctuous clay than she did in anything else, and that the "Jinga" was designed for soft clay. The cutter of the "Jinga" is the same as the cutter of the "Sir George Lloyd." If, in the case of the "Jinga," which was designed for soft clay, it did better work in this stiff unctuous clay than in anything else surely the "Sir George Lloyd" dredger also designed for soft clay with a similar cutter, ought to do equally well in this stiff unctuous clay.

Q.—You must have studied the lamentable figures of the "Kalu" and the "Jinga"?
A.—I attribute the lamentable figures of the "Kalu"——

Q.—Will you please answer my question first. We will have to come to those figures later. The figures of the "Kalu" and the "Jinga" are lamentable, are they not, as regards output?
A.—I have not studied them in detail.

Q.—I will take you through them, and we will see what sort of performances the "Kalu" and the "Jinga" did when they got to work. They are lamentable figures if they are true?
A.—I can quite understand them, and I can appreciate what Mr. Kidd says, that when he took one of the Port Trust dredgers and worked it properly, and paid a bonus to the crew, he got a far, far better output than the Port Trust had ever had at their very, very best. I attribute it to the working of the dredger.

Q.—When did you ever mention to the Government of Bombay, or to Sir Lawless Hepper, that they should pay a bonus?
A.—I mentioned it in one of my early annual reports, but the Government of India were so opposed to paying bonuses of any description to anybody that I looked upon it as almost hopeless to think that they would. They never do pay bonuses.

Q.—That is to be found in one of these annual reports, is it?
A.—It is in one of the annual reports.

Q.—I will find it later.

A.—It is not a specific request for bonuses for the dredger. It is simply stating that the disadvantage that the Government has in carrying out works in comparison with a contractor is because they cannot give any encouragement for good work.

Q.—Did you think, in 1919, that you would not get 2,000 cubic yards per hour unless a bonus were paid to the men?

A.—I did not know, in 1919, under what conditions the dredger was going to work.

Q.—As technical adviser to the Government of Bombay, do not you think that you must have put that forward as one of the necessary conditions of employment?

A.—I was not carrying out the work.

Q.—You were technical adviser?

A.—I was technical adviser.

Q.—You say that you mentioned this question of stiff clay at Renfrew. Mr. McMurray has put that interview round about the third week in August, I think. Would that be about right? At all events it is before the letter of the 12th September. Was the interview to which you are referring before the 12th September?

A.—It was on the 29th August.

Q.—What did you say to Messrs. Simons & Co. about its being necessary for the dredger to work in stiff clay?

A.—What happened was this——

Q.—Will you deal with this one point for the moment?

A.—I remember a long discussion on the subject of the material to be dredged. In my letter I had used the word " clay," which is rather indefinite. We read Mr. Kidd's description of the material. Mr. McMurray gave his experience in working the " Jinga " and the " Kalu " which were specified for soft clay, and we considered the material in the harbour to be more or less the same as at Sewri. Colonel Brown, who is I think dead, said that obviously what we wanted was a dredger to cut soft clay, the same kind of dredger as they had had at Sewri. I agreed, and I still maintain that it was the correct designation for the dredger, a dredger to dredge soft clay.

Q.—Were not you greatly astonished when you read Mr. McMurray's evidence?

A.—I have not read his evidence yet.

Q.—Have you not?

A.—Not the whole of it.

Q.—I will take you through some of the material passages in a moment. The letter of Messrs. Simons & Co. on 12th September, which you appended to your report, specifies a dredger designed for soft clay?

A.—Yes.

Q.—And you were content, of course, to let that description pass?

A.—Yes.

Q.—First of all he puts great insistence upon the fact, with which, of course, you do not disagree now, that his firm only promised to deliver a dredger to give 2,000 cubic yards per hour in soft clay?

A.—Yes

Q.—You and he are agreed about that?

A.—Yes.

Q.—Did you notice in that evidence that he disclaimed any possibility of the dredger being able to do that amount in hard clay?

A.—I quite agree. Naturally she would not do 2,000 cubic yards an hour in *this* sort of stuff. (*Indicating sample of hard clay.*)

Q.—Is there any distinction to be drawn between stiff clay and hard clay?

A.—Yes. *That* is hard clay. (*Indicating sample of hard clay.*) Naturally the dredger would not do 2,000 cubic yards an hour in this, but she would do 2,000 cubic yards an hour in stiff clay, which is synonymous with soft clay.

Q.—Stiff is synonymous with soft?

A.—I would like to show a sample of my clay.

Q.—Do you know of any other material in this world in which stiff is synonymous with soft except clay? I thought they were two opposing ideas. I thought that stiff meant one thing and that soft meant another?

A.—No, not when you are dealing with material under water. A stiff clay is a clay that is like hard cheese or butter. You can cut it easily with a cutter. That is what I call stiff clay. You could not have anything better than stiff unctuous clay, stiff greasy clay for a dredger designed to cut soft clay. You could have nothing better in this world than stiff unctuous clay. Mr. Kidd has told you, as I have said before, that the dredger " Jinga " was better (he uses the words) in stiff unctuous clay than in anything

else. Mr. Settle brought these samples back. Here is a bit of the stiff unctuous clay. (*Producing sample.*) May I have a little water?

Sir Frederick Hopkinson.— Of course the Committee has seen the clay as it exists to-day on the Reclamation.

Chairman.—We sent a man in for about 25 yards to get some, and he very nearly got drowned.

Sir Frederick Hopkinson.—That is in the mud?

A.—Even *this* stuff (*indicating sample of hard clay*) the dredger deals with well.

Q.—Would you mind telling us what you are going to do?

A.—I merely want to see what in a few minutes time this is reduced to. This water will show you what it is like in the ground.

Chairman.—Does *that* come from No. 1, No. 2 or No. 3 (*indicating sample of hard clay*)?

A.—That is No. 2.

Sir Frederick Hopkinson.—May I see the dry sample that you have produced?

A.—Yes. (*Same handed.*) (*The Witness placed a piece of the sample of hard clay in a glass of water, and in another glass of water a piece of the sample which he had produced.*)

Chairman.—Have you also noticed with regard to Mr. McMurray that he says that if he had had to specify for a dredger to deal with hard clay he would have had to put forward a very much bigger and indeed unworkable dredger and one much more costly?

A.—Yes, but he was not asked to design a dredger for hard material.

Q.—In your letter of 25th July you asked for a minimum rate of 2,000 cubic yards per hour. Did you notice in the reply of 12th September that they do not offer you a minimum rate, but they say "at the rate of 2,000 cubic yards per hour"?

A.—At the rate of 2,000 cubic yards per hour.

Q.—There is a distinction, is there not, between a request that a machine shall do a minimum rate of 2,000 cubic yards per hour and an offer that it shall do at the rate of 2,000 cubic yards per hour?

A.—Yes. I think you will find somewhere in the correspondence a statement that the pump will do a great deal more than 2,000 cubic yards per hour.

Q.—Not in any document that formed part of the contract with Messrs. Simons & Co.?

A.—I did not make the contract with Messrs. Simons & Co.

Q.—I think you will find that Messrs. Simons & Co. are very canny, and all that they were offering you was a dredger that would do at the rate of 2,000 cubic yards of soft clay per hour?

A.—Yes. I was going to say that nothing will make me change my mind. I have seen the dredger, and I have seen the material. If I were to start to work all over again I should not specify for any dredger other than a dredger to dredge soft clay for that material that is in the harbour. If I had it all to do again I would not have a different dredger at all. I would have the same dredger designed to dredge soft clay as is working there now.

Q.—Did you want a trial of the dredger at Bombay?

A.—No. I think I mentioned it, but it is so very unusual. I cannot recall a single instance of a dredger ever being tested thousands of miles, or even hundreds of miles, away from the builders' yard. I mentioned it, but I never seriously expected that I should get a test in Bombay. I did not want it.

Q.—Did you know that the "Kalu" and the "Jinga" had been taken out and given a trial at the site?

A.—I was told that they were. I do not know what the particulars are. I was told they were given some sort of test, but it is a thing that we never do. I do not know of any other instance of a dredger being tested on the site. I have heard that the "Jinga" and the "Kalu" had some sort of test, but I do not know any other instance whatever of the builders giving the guarantee hundreds or thousands of miles away from the yard. There may be such cases, but I certainly do not know of them.

Q.—Curiously enough, Messrs. Simons & Co. were the builders of the "Kalu" and of the "Jinga," and they did, in fact, take both those vessels out to Bombay, and they did an eighty hours' test of each?

A.—Yes.

Q.—In your letter of 25th July you had stated that you would be satisfied with a test on the Clyde?

A.—Yes.

Q.—Mr. McMurray has told us a very singular story. He says that when you had your interview in August at Renfrew you re-opened this whole question about a test on the Clyde, and pressed very hard for a test at Bombay; is that true?

A.—No, I never pressed for a test at Bombay. I mentioned it, as you may say, *en passant*: "Give us a test at Bombay," but it was instantly rejected. I never regarded it as serious. I was quite satisfied with the test on the Clyde. I never wished a test at Bombay. It never seriously entered into my mind that I should get a test there. I have had dredgers before, and I have never wanted a test for the dredgers on the spot; it is unusual.

Q.—Mr. McMurray has told us in evidence that extends over two or three pages that there was quite a considerable discussion about this matter at Renfrew. He says at Renfrew again you re-opened it, and you did want a test on the site; they were emphatic, and they would not give you a test on the site, would they?

A.—I remember some discussion about a guarantee, but I certainly never pressed for a builders' trial in Bombay. All the dredgers with which I have ever had to do, or about which I have had knowledge, were tested in the neighbourhood of the builders' yard. I am told that the Bombay Port Trust specified for some sort of guarantee in Bombay, but that is, I think, a unique case; at all events, I was satisfied with delivery in Bombay, and trials on the Clyde, and that is the usual procedure.

Q.—The only point I want to make is this: Mr. McMurray, to your knowledge, understood Bombay conditions, did he not?

A.—Yes.

Q.—When he refused to have anything to do with a trial at the site at Bombay did not that make you a little suspicious or doubtful?

A.—Not at all.

Q.—It would be only a question of money, would it not? The dredger and plant cost £655,000?

A.—Yes.

Q.—You could have said to Mr. McMurray: "We want a trial at Bombay. What is your price for a trial at Bombay?" They were going to work her out to Bombay?

A.—Yes.

Q.—Why should not they test her out there? It can be nothing more than money, can it?

A.—There are plenty of places in the world with analogous cases where they did not want to have guarantees. It never occurred to me as necessary, and I still think it was not necessary.

Q.—The under-current in Mr. McMurray's evidence, which can be brought out with a little care is that Mr. McMurray was going to give you no test in Bombay Harbour, because he knew perfectly well that he had come across clay in Bombay Harbour which the "Sir George Lloyd" might cut at only 500 cubic yards per hour. Between now and Monday will you look into Mr. McMurray's evidence?

A.—I will read Mr. McMurray's evidence.

Q.—That is a matter with which I think you ought to deal. Mr. McMurray was almost cynical about the matter, and he was not prepared, under any conditions, to give you a test at Bombay because he knew the conditions of Bombay, and the capabilities of the "Sir George Lloyd." If you will look at the evidence between now and Monday we will go through those passages, and see if we can make that point good.

A.—If Mr. McMurray thought that his dredger was going to dredge in strata No. 3 of course he knew it would not give the output.

Q.—If it was going to dredge under ordinary dredging conditions the material which would be found in Bombay Harbour, as distinguished from Sewri?

A.—We have already got Mr. Kidd's evidence who, presumably, knows a great deal more about the material than Mr. McMurray. Mr. Kidd tells us as a fact that the material is exactly the same in the Harbour as it is at Sewri. After all, you must attach some importance to Mr. Kidd's evidence. He was out there for a number of years. Mr. Kidd tell us, in substance, that he satisfied himself that the material is the same at Sewri as it is in the Harbour, and the same as in the Marine Dockyard.

Q.—As far as you remember, were the words "soft clay" first used in the document of 12th September, that is the letter attached to the Report? You had said "clay" on 25th July?

A.—Yes.

Q.—"Soft clay" are the words used by Messrs. Simons & Co.?

A.—Yes.

Q.—You had asked other firms for tenders, had you not?

A.—No, I asked other firms afterwards.

Q.—Was that in 1920?
A.—That was in 1920.

Q.—Messrs. Lobnitz?
A.—Yes.

Q.—Messrs. Ferguson?
A.—Yes.

Q.—Messrs. Fleming?
A.—Yes, Messrs. Fleming and Messrs. Ferguson.

Q.—Do you remember whether, in writing to them, or sending them any particulars, you described the clay as stiff, or hard, or soft?
A.—As a matter of fact it was not done by me. The whole of that was done by the late Mr. Meik.

Q.—He died in July, 1923?
A.—He died in July, 1923.

Q.—But still, it was your firm of Messrs. Meik & Buchanan who were under the Agreement of 7th March, 1921?
A.—Yes

Q.—Do you happen to know whether in sending any particulars to Messrs. Lobnitz, Messrs. Ferguson, or Messrs. Fleming, your firm described the clay as soft, or stiff, or hard?
A.—I do not think there is any record on that subject, because it was a matter of personal discussion with Mr. Meik, as far as I remember.

Q.—Have you looked through the documents lately to satisfy yourself about that?
A.—I have, and I will look again.

Q.—I suggest to you that in correspondence with Messrs. Lobnitz, your firm definitely stated that the material was soft clay?
A.—In that case it was a right designation.

Q.—Did Messrs. Lobnitz, in reply, state that the output of the dredgers that they proposed to specify, whilst being 2,000 cubic yards per hour in soft clay, would not do 2,000 cubic yards per hour in harder material?
A.—If they did, they said the truth undoubtedly. Of course, with a dredger specified to do 2,000 cubic yards in soft clay, no one would expect it to do 2,000 cubic yards in *that* material, for instance. (*Indicating sample of hard clay*).

Q.—I have not referred you to the documents. You took exception to producing the tenders?
A.—We do not usually do that.

Q.—It does not matter, because we have got all the documents from Messrs. Lobnitz, Messrs. Ferguson, and Messrs. Fleming. We have got them here.
A.—Yes.

Q.—I am right in thinking, am I not, that in your Report you approved of the description of the clay as given by Mr. Kidd?
A.—I did, yes.

Q.—In terms?
A.—In terms.

Q.—As stiff?
A.—As stiff clay; stiff clay, that is stiff unctuous clay, in which the "Jinga" did such extraordinarily good work.

Q.—The suction dredging pumping horse-power of the "Sir George Lloyd" was 3,000 horse-power, was it not?
A.—I think it was 3,500.

Q.—I suggest to you that it is 3,000?
A.—3,000.

Q.—On a matter such as horse-power may not Mr. Kidd be regarded reasonably as an expert?
A.—I have no information about that; I could not say.

Q.—Mr. Kidd, when giving evidence, was reading out certain items to show how he arrived at 325·23 lakhs?
A.—Yes.

Q.—At page 42 of Mr. Kidd's evidence he was asked: "The total cost of the dredging plant supplied for the Back Bay reclamation was about £855,000"; that is including, of course, the purchase of the "Kalu" and the "Jinga"?
A.—Yes.

Q.—" Can you give me any idea of the amount included in your estimate for plant? —(A.) I think I can. I have carefully kept my original estimate book.—(Q.) I want you to include the pipe lines.—(A.) Perhaps you would like me to run over the items? —(Q.) Yes, if you will. I will put them down if you will call them out." Then Mr. Kidd had a very old book with him. This was the original estimate book?

A.—Yes.

Q.—He said: " (A.) Pump filling, plant delivered and erected at Bombay; a dredger of 7,500 horse-power." At that he was interrupted, and the assertion was made: " That is two-and-a-half times the horse-power of the dredger sent out there." Then Mr. Kidd made a most expressive gesture, and he said: " Your difficulties are explained." Mr. Kidd's view was very definite that a dredger of the horse-power of 3,000 could not deal with the clay in Bombay Harbour, as he knew it to exist. What do you say about that?

A.—What I say about it is this: " Mr. Kidd's dredger was an American dredger. It was an American dredger of 7,500 horse-power. I am not speaking as a fact, but I rather think that if you investigated it you would find that, in the case of an American dredger, they add up all the horse-power together, the horse-power on the cutter, and the horse-power on the pumps. The total horse-power of the vessel is 7,500, whereas in the " Sir George Lloyd " the horse-power was only on the pumps.

Q.—Surely Mr. Kidd, when he spoke of 7,500 horse-power, meant on the pumps?

A.—I would like to know what Mr. Kidd meant.

Q.—At the bottom of page 43 Mr. Kidd was asked: " There is one thing to be noticed, and that is that your plant in 1912 gave two-and-a-half times the horse-power of the ' Sir George Lloyd '?—(A.) Quite so. That is a very important point." It was obvious that the question was with regard to the suction-dredging power, and not the propelling power?

A.—I think, if you were really to get the facts of that, you would find it was as I state, that it was not 7,500 horse-power on the pumps. The American practice is to combine all the horse-power together. That is my impression. My impression is that it is not 7,500 horse-power on the pumps.

Q.—Do you know the indicated horse-power of the " Sir George Lloyd "?

A.—No; I cannot remember it. I have not it in my mind.

Q.—In connection with the actual ordering of the dredger, you and Sir John Biles were jointly responsible for it?

A.—Yes.

Q.—Before accepting Simons' offer of 12th September, did you ever discuss with Sir John Biles the fact that Mr. Kidd had spoken of the clay as stiff clay?

A.—No; never.

Q.—Did Sir John Biles have your report before him?

A.—That I could not tell you.

Q.—Did you never give him a copy of the report?

A.—Never.

Q.—I ask you because the letter of 12th September was appended to your report, so all that Sir John Biles had was the letter of 12th September to begin with—Simons' offer.

A.—Really, I do not know what Sir John Biles had, because it was taken entirely out of my hands.

Q.—He said in practice the civil engineer tells him what the dredger has to do, and he tries to produce something that will do it. Of course, there was an interview at which you and he discussed the fact that the dredger had to be built?

A.—Yes.

Q.—The question was, who was to build it?

A.—Yes.

Q.—You described to Sir John Biles the sort of work you wanted the dredger to do?

A.—Yes.

Q.—Two thousand cubic yards of clay per hour in Bombay Harbour?

A.—Yes.

Q.—Did Sir John Biles never ask you what the clay was like?

A.—No; he certainly never asked me what the clay was like.

Q.—He had before him the letter of 12th September. At page 6 of his evidence this question is put to Sir John Biles: " Suppose a buyer wanted a dredger to cut soft clay, and indicated his wish that it should be a dredger to cut soft clay, would that

dredger be different in its construction to one that another buyer ordered which was wanted to cut stiff and unctuous clay "? That is the point, you see.

A.—Yes.

Q.—" Would there be likely to be any difference in the specifications by the makers "? he is asked, and Sir John Biles says: " You mean in the case of stiff and unctuous clay instead of soft?—(Q) Yes.—(A) Yes; I think there would, but 'stiff and unctuous ' is not a very definite term.—(Q) Neither is ' soft.'—(A) No; that is quite true.—(Q) But the word ' soft ' indicates a different consistency to the word ' stiff,' does it not?—(A) Yes; I suppose you would say it is different. You want to know how you would give effect to that difference." Then he says: " Well, I do not think he would make any difference, except perhaps a little in the cutter. The result necessarily is that he could not get as much output from the stiff and unctuous clay, or he might consider that he would not get as much output as he would from soft clay."

A.—The answer to that is: Why did Mr. Kidd with the " Jinga," which is designed for soft clay, get a better output in stiff and unctuous clay than in anything else? The fact remains that stiff unctuous clay is admirably suited for a dredger designed to cut soft clay.

Q.—That was at Sewri, was it not? That was not the harbour. It was the Sewri reclamation. We will deal with that later. Then, talking still about this clay, the question put to him is: " The clay might be so stiff as actually to stop the cutter?—(A) Yes; it might be so stiff.—(Q) I think some of the witnesses have said that that hard clay was hard enough to stop the cutter." Then Sir Frederick Hopkinson says: " No witness has ever said it was pulled up by the clay, only the moorum or rock." In point of fact, the evidence in Bombay with regard to the clay was that the " Sir George Lloyd " was a thoroughly good machine which would cut through the silt, of course, and the clay, but slowed up in the moorum. That is the evidence, is it not?

A.—Yes; and I accept that. Of course, it would slow up in the moorum.

Q.—But cut through the clay?

A.—Yes.

Q.—That is No. 2 in your little plan?

A.—Yes.

Q.—Nobody in Bombay has ever suggested that the " Sir George Lloyd " cannot cut through all the clay that is in the harbour. You have noticed that, of course?

A.—I think I have noticed that.

Q.—The question is: Could she do it at the speed of 2,000 cubic yards per hour? That is the only point.

A.—Yes; in my opinion, for what it is worth, I say she can under proper conditions, and later on I hope to put the evidence by Mr. Settle before you, who personally went out to investigate the dredger at the time that I was so ill that I was not able to go.

Q.—Have you seen the report of Sir Alexander Gibb?

A.—I have seen it, but I do not think I have studied it very much.

Q.—That report would be in 1926?

A.—Yes.

Q.—He says at page 2: " The results of the dredging up to the present are most unsatisfactory, and though they may at times show some improvement, I am of opinion that even though the restrictions by the Royal Indian Marine and the Bombay Port Trust authorities were removed they are never likely to be economical; that the reason for this is the unsuitability of the dredging plant for dealing with the material as it exists, both in the harbour and in Back Bay."

A.—Well, that is Sir Alexander Gibb's opinion, but it is not mine.

Q.—We have got to take opinions, have we not, and consider them?

A.—Yes.

Q.—You have given your opinion and Sir Alexander Gibb has given his. If that is the fact, that the horse-power of the " Sir George Lloyd " is not sufficient to deliver 2,000 cubic yards of stiff clay an hour, is not that to some extent borne out by the figures from 1923 to 1926?

A.—No; I have seen no evidence to show that the " Sir George Lloyd " will not deliver the 2,000 cubic yards per hour. She has done it frequently. I think you will find that Mr. Brims in his evidence says that she has done it for a certain period. She has done that for a few weeks. If she will do it for a few weeks, she will do it for six months. I maintain that there has never been any proof whatever that the " Sir George Lloyd " will not deliver 2,200 cubic yards of soft clay per pumping hour.

Q.—Assuming that, the question is whether the " Sir George Lloyd " was working in what can fairly and properly be described as soft clay. That is the difference between the opposing sets of views?

A.—Then as I have pointed out, we have not once but several times said : " You are working in the wrong material. Get away. Get your output. Do not go digging away in the moorum."

Q.—You will let us have those letters?

A.—Yes.

Q.—I do not know of any letters where that has been said.

A.—This is a letter, dated the 15th October, 1925, from my firm to the Secretary of the Government of Bombay. I do not know whether you have seen this : " The lowness of the output of the ' Sir George Lloyd ' is in our considered opinion due to one of two causes, or probably a combination of the two : (*a*) unsuitable material; (*b*) inefficient handling of the plant. It is obvious that if the dredger is put to work in such hard material as that the cutter blades are damaged, as we understand was the case last season, or if the dredger with the booster is asked to deliver continuously through a length of pipe-line largely in excess of 10,000 feet, the output must be greatly reduced. We are, therefore, of opinion, and so informed Mr. Brims when he was here, that when the dredger is found to be working in this hard material the suction pipe should be lifted and the operations continued in the softer clay overlying the rock." Mr. Settle will confirm that from his investigations in the winter of 1925, when he was out there.

Q.—In point of fact the " Sir George Lloyd " was designed to dredge down 70 feet below low-water level?

A.—Yes.

Q.—By reason of the orders of the Royal Indian Marine the dredging was limited to 35 feet?

A.—Yes.

Q.—Is it the fact that at 35 feet you encountered moorum rock in any quantity?

A.—I do not think we ever did any dredging at all along the area prohibited by the Indian Marine. So far as I know, we have not been there.

Q.—Were you dredging at any point down to 70 feet?

A.—I cannot tell you. I have no information on that.

Q.—Was not the limitation by the Indian Marine a general limitation : " You shall not dredge anywhere below 35 feet "?

A.—No, only certain areas.

Q.—So be it. Can you explain the figures of output as I have given you, which for 1923-24 was 1,020, for 1924-25 856, and for the last year 959 per hour, instead of 2,000?

A.—I can explain it.

Q.—What is the explanation?

A.—I say if you get rid of all these people in Bombay, and are free from all Government restrictions, from all the incubus of Government control, and let somebody get hold of these dredgers, you will find an enormous difference. That is my solution. If you will pay them a bonus, you will observe a great difference. I must repeat again Mr. Kidd's remark on the enormous increase when he paid a bonus to the men he had. He said he got a better output than the Port Trust ever had. I say again and again that the dredger has never been given a proper show, and the sooner the present personnel are got rid of and the dredgers made to work properly and an incentive given to the crew and superintendents in the shape of a bonus for output, you will see the most astonishing change there.

Q.—As to the present personnel, Mr. Speirs is still the dredging master?

A.—He is still the dredging master.

Q.—Is not he an efficient dredging master? He has got a very good record?

A.—Yes, he has got a very good record; but he is getting on in years. He only went out the last time on a special medical certificate. First of all he was rejected at the India Office; and it was only by my interfering and saying : " If you do not let this man go out we shall not be able to start dredging at all " that the Indian Government gave him a sort of special licence to go out and work for a certain time; but he has not got a first-class bill of health, and he is getting on in years, and certainly I should ask him to retire.

Q.—You notice that the first year's output was 1,020 cubic yards a pumping hour; and the second year's output was 856?

A.—Yes.

Q. Does not that point to the fact that in the second year they were getting into harder material?

A.—No, they had a most extraordinary series of accidents in the second year. No one was more annoyed than myself. I happened to be out there when it was proceeding. They had one misadventure after another, and they lost a whole month at the beginning of the season. It was very difficult to lay the blame on anybody. Those were misadventures that came about, but it was nothing whatever to do with the dredger.

Q.—I do not think you quite appreciate the point. I am not giving you the volume of the year, I am giving you the average of 856 per pumping hour when the machine was actually working. Instead of doing 2,000 cubic yards, she did 856, so that it does not matter whether she worked for 50 hours, or 500 hours or 5,000 hours, the average was 856 cubic yards per pumping hour instead of 2,000. Does not that point to the fact that she was working in the second season in harder material than in the first season?

A.—As far as I can say from personal observation when I was there she was working in very much softer material in the second season than she was in the first.

Q.—We were told you were on the " Sir George Lloyd " for an hour or two occasionally. Is that about a fair description?

A.—I was on the " Sir George Lloyd " for an hour or two occasionally, but I do not think a single day passed when I did not go and look at the output the whole time I was there.

Q.—Coming from the end of the pipe?

A.—Coming from the end of the pipe; and my distinct impression is—I know I am correct—that the second year's material was considerably softer than the first year's.

Q.—Did you see at the office of the Development Directorate the soundings that were taken each day? You know the practice? We have been told that the " Sir George Lloyd " began to dredge on 8th December, 1923?

A.—Yes.

Q.—We were told on the next day it was the practice to take soundings and see what amount she had dredged from the bed of the sea. We were told that these soundings were taken every day and were sent to the Director of Development. Did you ever see those?

A.—Never.

Q.—They would have told you as an engineer at once what the position was?

A.—I do not think any regular soundings were taken; but I can bring evidence later on about that.

Q.—There is the evidence. There is a point as to why it was that Mr. Lewis, and why it was that Sir Lawless Hepper and other people did not realise at once that the dredger was not giving the guaranteed results. They have said that every day there came into the office of the Development Directorate soundings recording the workings of the previous day and that therefore anybody looking at them would be able to get a very fair idea of what the vessel was doing. Did they never show them to you?

A.—It is the very first I have ever heard of it.

Q.—Really? Did it never occur to you that in ordinary practice they would take soundings?

A.—Yes; I have often spoken to them about soundings; but I did not know that they took soundings every day. In fact, I find it hard to believe that they took soundings every day; but I will bring evidence about that point.

Q.—Did they never show you any document recording soundings?

A.—I cannot remember any document regarding soundings. I have often discussed soundings with Mr. Brims; but I do not remember any document recording soundings.

Q.—If it is the fact, as Mr. Lewis and other witnesses have said, that every day they had a record of the preceding day's work, it ought to have been known week by week approximately how the dredger was doing, ought it not?

A.—They ought to, yes. But I cannot accept that statement that they took soundings and calculations every day.

Q.—I am not saying " and calculations," I am saying that they took soundings?

A.—Well, I hope to be able to bring evidence on that point.

Q.—They may have taken soundings and the soundings may have come into the office and may have been put away?

A.—They may have been put away.

Q.—Mr. Lewis went out as Resident Engineer?

A.—Yes.

Q.—By the agreement of 7th March, 1921 (I do not know that it is important), he stood in rather a curious position to you?

A.—Is this in the statement?

Q.—No; I will go on with that in a moment, but I want to finish this. It is the 7th March, 1921. I am not going to elaborate this now, but it says " The Resident Engineer will be nominated by the firm "—that is yourselves?

A.—Yes.

Q.— ——" and will carry out the details of the work in accordance with the firm's instructions."

A.—Yes.

Q.—We will discuss what the agreement means afterwards, and if you can tell us what it means we shall be very glad; but was it not Mr. Lewis's duty to keep you informed of the progress of the work?

A.—Certainly it was his duty to keep us informed of the progress of the work.

Q.—If after the first or second or third week the dredger " Sir George Lloyd " began her working he had ascertained from soundings that she was not delivering 50 per cent. of her guaranteed output. Was it not his duty to communicate that to you at once?

A.—Yes.

Q.—In fact you were not told of it until after July of 1924?

A.—As far as I can remember we were not told of it till after July.

Q.—Now may we get back to your statement at page 31? You say that you left Bombay on the 31st May, so that in fact you spent from the 19th May to the 30th May at Bombay, and those 11 days only?

A.—That is all.

Q.—Then you mention the fact of your partnership with Mr. Meik?

A.—Yes.

Q.—I have referred to the Rangoon River Training Scheme and the appreciation with which your work was received there. At the conclusion of the Mesopotamian work you received a letter from the Government of India which said: " I am also to convey the appreciation of His Majesty's Secretary of State for India of the valuable services rendered by you in the appointment mentioned, and to say that the Government of India associate themselves with the Secretary of State's appreciation of your work. The success of our arms in Mesopotamia has been sensibly promoted by your valuable advice, great powers of organisation, and experience of the conditions of Indian ports." Then you say: " In discussing the question of dredging at Bombay between ourselves, that is the firm of Messrs. Meik & Buchanan and firms of dredger builders, we considered that we were reasonably safe on two points, namely, the area over which dredging should take place, and the precise nature of the material to be dredged." The precise nature of the material to be dredged you had been informed was stiff and unctuous clay?

A.—Yes.

Q.—" The scheme on which we are asked to report had already been definitely accepted by the Government of Bombay and had been sent to the Government of India for sanction. I cannot recall in my professional experience a single instance where more complete borings had been taken." The fact that borings had been taken, and most complete borings, lent weight and emphasis to Mr. Kidd's description of stiff and unctuous clay?

A.—Yes, soft clay, stiff and unctuous clay.

Q.—I did not quite catch that?

A.—Soft clay, stiff unctuous clay.

Q.—But Mr. Kidd's report does not contain the word " soft " clay at all?

A.—But it was soft clay.

Q.—I appreciate that. I am only on the point of Mr. Kidd's report. You have made your point perfectly clear, and we shall have to examine it. You say the clay was soft. All I am pointing out is that at the moment when you were discussing this matter with Mr. Meik and the firm of dredger builders, the only information that you had was the fact that Mr. Kidd had taken most complete borings and that he asserted that clay to be stiff and that you in your report said you agreed with Mr. Kidd as regards his description of the character of the clay?

A.—Yes, but the very method in which Mr. Kidd took his borings is sufficient proof that there could not have been on any of his borings anything very hard. The way in which he has taken his borings he would have not gone through hard.

Q.—Did you notice that Mr. Kidd said in every case he went fully 70 feet below the low water level, or got alternatively into moorum or rock?

A.—Yes.

Q.—So that he did get through in many places, as you can see in plan No. 5—he did get down to 70 feet?

A.—Yes.

Q.—By that curious method of wash boring?

A.—He could not have gone through hard with wash borings.

Q.—We do not quite know what part that (*i.e., hard clay specimen*) was in, but he has told us there were four men holding on to the pump and putting the whole of their weight on to it as it sank through the stiffer clay.

A.—Yes. If it would interest you here are three photographs of Mr. Kidd and his staff actually taking borings.

Q.—I think we can accept your statement that that clay as it is would not yield to any wash borings of the nature described by Mr. Kidd.

A.—Quite so.

Q.—That must be so. These photographs show the thing exactly as he described it. These are the men working with Mr. Kidd in 1912?

A.—Yes.

Q.—It is just as he described it. Then you refer to the letter and say: "Such a letter from a responsible Government presupposes that all questions as to the right to dredge within the area selected by Mr. Kidd had been considered and disposed of." You say this scheme had already been accepted by the Government of Bombay in 1912 who had stated in their letter to the Government that the drawings might be considered as complete working drawings. We have that letter.

A.—Yes.

Q.—The point you are making now is that such a letter from a responsible Government presupposes that all such questions as to the right to dredge within the area selected by Mr. Kidd had been considered and disposed of?

A.—Yes.

Q.—Let us discuss that for a few moments. The position was, was it not, that the Development Directorate started out with a proposal to dredge 25,000,000 cubic yards of material in which they had no proprietary right at all?

A.—Apparently they had no proprietary right, but nobody knew they had no proprietary right.

Q.—Did not anybody know of Section 28 of the Bombay Port Trust Act, which vested the whole of the bed of the sea in the Port Trust? I am implying no criticism of you naturally, but I want to get the facts out. Did nobody know that?

A.—Apparently. The Port Trust themselves were not aware of it.

Q.—They may not have been, but somebody became aware of it, did they not? It is a ludicrous situation.

A.—It is a most ludicrous situation.

Q.—On 3rd August, 1920, Lord Lloyd makes a speech in which he announced the creation of the Development Directorate. The Development Directorate solemnly propose to take 25,000,000 cubic yards of somebody else's property, and then the Port Trust and Indian Marine wake up and begin to ask questions. Then the Port Trust and Royal Indian Marine cut out of the dredging proposition over 15,500,000 cubic yards of the 25,000,000 cubic yards that were wanted for the reclamation. That is the fact, is it not?

A.—That is the fact.

Sir Frederick Hopkinson.—No, out of 75,000,000 that was available.

Chairman.—We must take the letter of Mr. Lewis's of the 31st August, 1921. If that is wrong, it must be put right.

Sir Frederick Hopkinson.—Of the portion they had selected; I agree with that.

Chairman.—Let us get it right, because it is a very curious position. This is Mr. Lewis's letter on the subject. As I say again, it does not imply any criticism of you, but I only want to get the facts.

A.—Yes.

Q.—This is the letter of the 31st August, 1921, from your Resident Engineer to yourselves: "The reduction of material available due to exclusion of the area to the north of the pencil line on the chart sent by the Port Trust amounts to 8,280,450 cubic yards." The Port Trust had said: they would not allow you to come north of a certain line.

A.—Yes.

Q.—"The reduction of material if dredging is limited within the naval anchorage to 35 feet below low water of spring tides, amounts to 7,292,446 cubic yards, or, both together, 15,572,896 cubic yards." The Development Directorate were bound to obey anything the Port Trust or Indian Marine said about this matter, were they not?

A.—Yes.

Q.—Let us continue: "The amount available over the total area, down to 70 feet below mean water level is 38,094,785, which reduced by 15,572,896 cubic yards becomes 22,521,889 cubic yards. The amount of filling required is estimated at 30,126,856 cubic yards. We are therefore 7,604,967 cubic yards short."

A.—I think, if I may say a few words, it is even more extraordinary that scheme after scheme had been prepared and sent up to the Government of India for approval by the Government of Bombay before the creation of the Development Directorate, and not one single word had been said about the rights of the Port Trust.

Q.—For 20 years no one had said one word about it?

A.—For 20 years.

Q.—The Port Trust and Indian Marine may have been waiting—I think there is a letter which suggests that until some step is taken there is no need for them to intervene.

A.—I think you will see in the correspondence a letter from Mr. Lewis to myself, dated the 4th March, 1921.

Q.—What is that?

A.—It says: " One point has been brought forward not officially as yet which is interesting. It appears that the only authority which can sanction any alteration of the Port of Bombay, such as the removal of the bed of the harbour, is the Port Trust. Well, although the Back Bay scheme has been based on the pumping of the bed of the harbour since 1905, the Port Trust have never been approached on the subject. I was told by one of the Port Trust engineers that should we start dredging, his duty would be to inform the port officer and have the work stopped. I mentioned this to Hepper, who remarked that that was not going to stop the Back Bay reclamation." Then in the same letter he says: " Apparently since 1905 it has always been the idea that dredging should be done in the harbour and pumped across to Back Bay, but the Port Trust have never been officially told that such was the intention. They only discovered this a short time ago, and this is the result." Whether he means they only discovered then they had never been officially consulted, or whether they had only just discovered after 20 years what their duties were, I cannot pretend to answer.

Q.—However, eventually was the deficit of 7,000,000 cubic yards proposed to be made up by Mr. Lewis by going out and adding four strips of 250 feet, which would have given 9,000,000 cubic yards?

A.—Yes.

Q.—That, however, was found out not to be practicable, and was never done—going further out into the harbour?

A.—I do not know about that.

Sir Frederick Hopkinson.—It has been partly done now. There is no question about its practicability.

A.—There has never been any question about its practicability.

Chairman.—I did not know that that had been done.

Sir Frederick Hopkinson.—A little has been done outside the area.

Chairman.—One consequence was that further pipe-line was required on the proposal to go into Back Bay, was it not?

A.—Yes.

Q.—That pipe-line came to 28 lakhs?

A.—On the proposal of going into Back Bay.

Q.—Do you remember that when the " Kalu " was bought further pipe-line was ordered?

A.—For the " Kalu "?

Q.—Yes. One of the reasons that the " Kalu " ever went into Back Bay was because the Port Trust and the Royal Indian Marine had cut off this area, was it not?

A.—That was one reason.

Q.—We are in agreement about that. If you had had no interference by the Port Trust or the Royal Indian Marine you need never have gone into Back Bay?

A.—We never contemplated going into Back Bay at all.

Q.—When you did contemplate going into Back Bay 28 lakhs had to be spent in buying further pipe-line?

A.—Not 28 lakhs spent on the pipe-line. I think the " Kalu " and her repairs and her pipe-line, and everything else, cost 28 lakhs.

Q.—There was a very vehement discussion about this in the Legislative Council concerning the 42-inch floating pipe and shore connections as costing 28 lakhs' worth of more pipe-line than was originally intended?

A.—I would like to verify that. Twenty-eight lakhs for pipe-line alone seems to me to be a very great deal.

Sir Frederick Hopkinson.—The amount required in accordance with the original arrangement was 10,000 feet. Ultimately they bought 35,000 feet.

Chairman.—Do you recollect that? The original amount was 10,000 feet?

A.—Yes; it was 10,000 feet.

Q.—Ultimately when you got the whole lot you had bought 35,000 feet, which is another 25,000?

A.—Yes.

Q.—It is put down there as an amount of 28 lakhs, and I can show you to-morrow, if you like, many pages of vehement discussion in the Legislative Council with regard to this item of 28 lakhs?

A.—Yes.

Q.—Twenty-eight lakhs is roughly £200,000?

A.—Yes; but according to my notes here I have got the purchase of the "Kalu" and pipe-line as 20 lakhs. I do not think the pipe-line alone cost 28 lakhs.

Q.—Let me go over that purchase. The "Kalu" cost £75,000?

A.—Yes.

Q.—You advised her purchase in 1919?

A.—Well, I shall say something about that—about my advising the purchase of the "Kalu."

Q.—We have got the actual text of your letter in which you suggested to the Government of India that she should not be disposed of as she might be of use in the East Colaba reclamation. That is the position, is it not?

A.—Well, there is something more than that.

Q.—Let us get it in this way. The "Kalu" was mentioned by you as a possible acquisition by the Government. Is that a formula you will agree to?

A.—No; my recollection about the "Kalu" is this. I have a distinct recollection of a conversation with Sir George Curtis in 1919 on the subject of the reclamation of East Colaba. Sir George Curtis said his pet scheme was the reclamation of East Colaba before the reclamation of Back Bay was taken up. Cotton Green was about to be removed shortly, and he thought it was imperative to use all the land at East Colaba as soon as possible. He knew the Back Bay scheme was in the ascendant, but he asked me whether I thought the "Kalu" could be made use of for East Colaba, and the two projects were to be worked concurrently. It was an unofficial conversation which took place when Sir George Curtis was showing me over East Colaba. I replied that I thought a dredger like the "Kalu" would be quite suitable for the work. A dredger was bought, but apparently without any inspection.

Q.—There was a letter written by you in September. It has been read in the proceedings of the Legislative Council?

A.—I think that letter was written after this conversation.

Q.—Have you got the letter?

A.—No; I do not seem to have the letter.

Q.—Here it is. This is a letter to Sir George Curtis dated the 24th July, 1919: "I think your Government ought to ask the Government of India not to sell the "Kalu" at present, because with new pipe-line she would do very well for reclamation on the East of the Colaba between Pilot Bunda and Sassoon Dock, which work might go on almost at once."

A.—Yes.

Q.—It is a matter of construction, but was not that a recommendation to the Government of Bombay to buy the "Kalu" for the purposes of reclamation?

A.—Yes; but certainly it did not begin on my initiative. The initiative was Sir George Curtis's, who had a very great desire to start reclaim at East Colaba, and who was not very much in favour of starting at Back Bay.

Q.—We need not mention East Colaba again because it is not within the terms of our reference. Therefore we make no point about that. The only point I am making is that it would appear from that letter written to Sir George Curtis that you were saying that the "Kalu" would do very well for reclamation?

A.—Yes.

Q.—That is the only point?

A.—I remember that letter. That letter was written with Sir George Curtis's knowledge after this conversation.

Q.—It was written to him?

A.—Yes; after this conversation that I had with him when he asked me about East Colaba.

Q.—Was I right when five minutes ago I put it that you had advised the purchase of the "Kalu"?

A.—Yes; put in that way—I had recommended it, or I had agreed to the purchase of the "Kalu."

Q.—You had recommended it?

A.—But not for Back Bay.

Q.—But for reclamation?

A.—For reclamation purposes.

Q.—As a suction dredger?
A.—As a suction dredger.

Q.—That is good enough.
A.—But I certainly had nothing to do with the inspection.

Q.—I am going to follow that up. Did you know the condition she was in?
A.—I had not the faintest idea. Naturally, I did not suppose anyone was going to buy a pig in a poke, and buy a thing without inspecting it.

Q.—Therefore, your letter to Sir George Curtis ought to be read with the understanding that the Government should acquire her if she was reasonably fit for the purpose of reclamation?
A.—Certainly.

Q.—Your letter said that she would do very well for reclamation.
A.—Well, a dredger of that type, on the supposition that she was in a good condition, would have done very well for the East Colaba reclamation. You could not want a better dredger for the East Colaba, but that letter was no guarantee that the dredger was in proper working order.

Q.—You used the " Kalu " in Mesopotamia, did you not?
A.—No.

Q.—Did you not have the " Kalu " over there?
A.—The " Kalu " was over there. The " Jinga " and the " Kalu " were taken up to Mesopotamia by the Royal Indian Marine. When I arrived in Mesopotamia I found the " Jinga " and the " Kalu " there. They had done no work at all, and the obvious reason that they could not do any work was that they drew about 12 feet of water, and they had been taken up to dredge a channel where there was only three feet of water, and sometimes no water at all. They could not cut their own flotation and so they did no work at all. They never even turned their engines in Mesopotamia. The pontoons were taken away and used for military purposes, bridges, and in due course the " Jinga " and " Kalu " having remained in Mesopotamia doing nothing for a year or two, returned to Bombay. That is the history.

Q.—Then they were bought by the Government of Bombay, and the " Kalu " remained idle for five years, did she not?
A.—I do not know how long she remained idle.

Q.—I will give you the figures in a minute. The Government of Bombay in November, 1920, agreed to pay £75,000 for her. You have heard of that figure?
A.—I heard that, but I was not consulted.

Q.—I am only asking you about the figure.
A.—Yes; I heard that.

Q.—In point of fact, did she do a single stroke of work until 1925?
A.—I think that is quite probably correct.

Q.—Interest at 6 per cent. on £75,000 would result in a dead loss of £22,500?
A.—Yes.

Q.—When the Government had bought this vessel for £75,000 did they find she required more than £25,000 worth of repairs?
A.—I am told so.

Q.—Did you expect her to be ready for work at the end of 1923? You need not trouble your recollection; I can show you at page 32 of these reports that you evidently did.
A.—Yes.

Q.—You expected her to be ready for work at the end of 1923, but, in point of fact, the repairs to the " Kalu " were begun in May, 1923, and completed in September, 1924?
A.—Yes.

Q.—You then say: " The dredger ' Kalu ' placed in thorough repair has cost, along with her pipe line, 23 lakhs, 63,367 rupees."
A.—Yes.

Q.—Roughly, £180,000?
A.—Yes. I remember telling Sir Lawless Hepper that I had never heard of anything more disgraceful, and that a new dredger could have been purchased for less than the money that had been spent on the repairs, almost.

Q.—Did you recommend that she should go into Back Bay to dredge?
A.—The " Kalu " was bought specially for East Colaba. They did not carry out the East Colaba scheme, and so it was thrown into the Development Directorate scheme.

Q.—But you were in possession of the " Kalu " and in possession of the pipe line?
A.—Yes.

Q.—Something had to be done with her. She had to be used in some way?
A.—Yes.

Q.—Did you recommend her to go into Back Bay?
A.—I did not initiate the Back Bay business.

Q.—Did you approve of her going into Back Bay? She was to work in series. I do not want to make a long story of this.

A.—Certainly I approved of doing anything to make use of her.

Q.—But did you approve of her going into Back Bay?
A.—Yes; I did approve of her going into Back Bay.

Q.—Let us see what happened when she got into Back Bay. To make that point quite certain, your firm had said in a letter of the 5th June, 1924: "'Kalu.' We adhere to our opinion that whatever the future decision respecting cables in Back Bay is "—there were certain cables laid which were going to be removed at the trifling cost of £25,000—three cables?

A.—Yes.

Q.—"Whatever the future decision respecting the cables in Back Bay is, the 'Kalu' should begin work next season in the area north of the cables and coloured pink on our drawing 3496, and in order that the work may be commenced by the 'Kalu' without any intermediate pumping station we recommend that the vessel be taken at high water to the nearest point to the new sea wall. She would go to this position at high water, and would then either dredge a hole for her flotation or float in a hole previously prepared by the 'Priestman' Grab Dredger. We have considered this matter very carefully and can see no difficulty, as when the 'Kalu' and 'Jinga' were working on the Sewri reclamation the first operation was to take the dredgers at high water and place them in a position where they had to dig their own flotation before they started work, and we understand the digging of the hole took three tides."

A.—Yes.

Q.—Though you are comparing the Sewri reclamation with the Back Bay reclamation, were not the two very different? You yourself had described Back Bay as shallow and rocky?

A.—Yes.

Q.—You could not compare the two things. In the Sewri reclamation we have had evidence it was nearly all mud and a very small proportion of clay.

A.—Yes.

Q.—If a dredger was caught in Sewri with a receding tide all she did was to sit down and nothing happened; but if the dredger was caught in the shallow Back Bay what would happen would be that she would become a wreck. That is the evidence. The two bottoms at Sewri and Back Bay in the evidence have been said to be completely different. What do you say to that?

A.—I would like to draw your attention to page 102 of my statement which shows how going to Back Bay was initiated.

Q.—Would you first answer my question as to whether comparing the bed of the sea at Sewri with the bed of the sea at Back Bay was a fair comparison?

A.—Not for the whole of Back Bay or for the whole of Sewri; but if you went and found a particular place in Back Bay where you could put your dredger you would do it; but I think in this letter we gave alternatives. We said they were to do one thing or the other.

Q.—As a matter of fact, you had said in that letter that at Sewri the dredger dug her own flotation in three tides?

A.—Yes.

Q.—Do you know that the "Kalu" was dodging in and out of Back Bay, going in when there was sufficient water on a rising tide under her keel to carry her in, and coming out before the water receded so that she would not lie on the rocks; and do you know that it took her the whole season before she made her own flotation?

A.—I do; and anything more disgraceful I have never heard of in my life.

Q.—Then let us follow it through.: I am taking this from one of your reports. Is this the fact: that she worked for an hour or two each day? She went in on the 28th November for an hour or two and kept that up till the 1st December—that is, three days?

A.—Yes.

Q.—She then had to stop because of the neap tide?
A.—Yes.

Q.—She started again on the 10th December and continued till the 14th December, and then she had to stop?

A.—Yes.

Q.—That is how it went on all the season through?
A.—Yes; it went on all the season through—I quite agree with you.

Q.—Were you there?
A.—I was there for part of the time.

Q.—What did you say about it?
A.—What did I say? What could I say?

Q.—You could say: "Stop it," could you not? Could not you have said: "Stop it"?

A.—It is very difficult to say "Stop it." I do not suppose there was a single day when I did not ask Mr. Brims about it, and he always said: "Well, we are just going to do it next tide," and so it went on day by day—"we are just going to do it next tide." Then I left Bombay; but in point of fact, I think they made a mistake in their borings. The borings in Back Bay on which our desire to go to Back Bay was founded were found afterwards to be quite inaccurate. Here is a letter from Mr. Lewis dated 7th May, 1923, in which he wishes to take the whole of the dredging from Back Bay. It is a letter from Mr. Lewis to my firm: "I send herewith the final results of the boring in areas 'A' in Back Bay." Then he goes on and says that the total volume required for the Back Bay reclamation is 25,000,000 cubic yards "so that there should be ample material available in Back Bay for the whole of the reclamation. The material is decidedly good. Even the worst material is a sandy clay which dries out very rapidly and would therefore seem very suitable for filling, much more so than the material we are likely to get in the harbour. The use of the Back Bay material would therefore seem to be clearly indicated." I understand that since I was in Bombay they have found that the borings were quite unreliable, and that they had not got sandy clay in Back Bay. When the "Kalu" was performing this laborious operation of going in every afternoon and back again the next day, it was on the supposition that there was some softish material, but really there was rock there. Later on I will return to that subject again. I have evidence which will be given you by Mr. Settle, because he was there after the date I was there.

Q.—Were you there for two or three months at the period when the "Kalu" was working?

A.—I was there, I think, for about two months.

Q.—I do not understand this. After all, you were looking out over Back Bay; you would see the "Kalu" going in, staying there for a couple of hours, and coming out again, a vessel costing £200,000, with the crew on board. Why did not you take some very drastic step about it? It must have been evident to you that there was a terrific waste of money going on?

A.—I do not remember exactly how many times I saw the "Kalu" doing that. Most of this I found out afterwards; but in any case I was not the Executive.

Q.—No, you were not, but you were the technical adviser to the Government, and you were in Bombay to supervise the work. You were there for two months while the "Kalu" was piling up an enormous cost against the enterprise, and I ask you why you did not intervene and stop it? You had recommended it to go into the Back Bay.

A.—I will find the exact date, but I certainly did not watch the "Kalu" for several months doing this; I was not there long enought for that; but I will give you the exact date.

Q.—Can you give me the date in 1924 when you arrived in Bombay?
A.—Yes.

Q.—Then we can follow it up. The "Kalu" started working on the 28th November, and was carrying on through the season. Would you be there during two months of that period?

A.—Did you say she started in November?

Q.—She started on the 28th November—that is, six weeks after the monsoon. I think you arrived on the 24th November of that year?

A.—I left on the 7th January.

Q.—You arrived on the 24th November and left on the 7th January?
A.—Yes.

Q.—The "Kalu" began these performances on the 28th November?
A.—Yes.

Q.—We now know what the result was. The result of that season's work was that in 10 weeks' work she gave less than nine hours of her guaranteed output. I am not sure that I have put that correctly. Sir Frederick Hopkinson tells me she did 15,400 cubic yards in the whole season, that is less than eight hours' work according to her guaranteed output; the result was that the amount reclaimed cost 15½ rupees per cubic yard.

A.—I quite understand that.

Q.—That is 31 times your figure of eight annas per cubic yard?
A.—Yes.

Q.—And your figure included the cost of the plant?
A.—Yes.

Q.—Whereas this figure of the cost of the " Kalu " is simply for ordinary working costs. Before we adjourn to-day I think we would like to know how it was that you, being in Bombay, allowed the " Kalu " from the 28th November down to 7th January to go on doing these ludicrous performances?

A.—Well, my explanation is that I was not the Executive. I was not in control of the works after I was told what borings they had taken. There was a chief engineer there, there was also a superintendent of dredging. On several occasions I asked them how they were going on, and they always told me that they were just on the verge of getting into it and getting her in flotation. It is very easy for a thing to go on for a considerable time under such circumstances and conditions. It is very difficult for me to go and say : " Well, you none of you know your business, you had better stop." I was not in charge of the Executive. Sir Lawless Hepper never even mentioned it to me, in fact nobody ever suggested that the dredging of the " Kalu " should stop. They all said : " Well, the borings are all right. We are just going to get on it, and then we shall go ahead."

Q.—If Mr. Lewis made a mistake in the borings, somebody let you down over that?
A.—Yes. It was not Mr. Lewis. It is on record who took the borings, but undoubtedly the borings were quite unreliable, but we did not know that the borings were unreliable.

Q.—What is the letter on which you rely as showing that the borings were satisfactory? You wrote a letter in May, but I do not appear to have that letter in my correspondence. I have an earlier one in which Mr. Lewis reports very badly about the borings in Back Bay?

A.—This particular letter is dated the 7th May, 1923 : " The material is decidedly good. Even the worst material is the sandy clay."

Q.—Mr. Lewis in his evidence was relying on a letter in which he spoke about the material in Back Bay. The only letter we have in the correspondence is an earlier one than that, which is also by him, but is condemnatory of Back Bay. No, I am wrong. This letter is out of order. It has been printed in the April correspondence instead of May, and it is on page 79, so I need not trouble you with that.

A.—I should like to say that we never initiated going to Back Bay; it was initiated by Sir Lawless Hepper and Mr. Lewis. They wanted to go to Back Bay; we did not want to go to Back Bay.

Q.—To finish off the performances of the " Kalu," not only did she do that very small volume, but do you know that she was actually turning out 225 cubic yards per hour instead of 2,000 at that period?

A.—I can believe anything about what the " Kalu " did in light of experience.

Q.—Am I right in gathering from your evidence that you do not regard that as an entirely satisfactory dredging operation?

A.—I regard that as a most unsatisfactory dredging operation. I would just draw attention to a letter from Mr. Lewis to myself dated the 20th May, 1921, in which he first of all talks about Back Bay, and says : " Hepper is quite keen on the investigation of the bottom of Back Bay." That is paragraph 131 of my statement. We always threw cold water on dredging in Back Bay. That is also on record.

Q.—You say on the 22nd June : " We have always held the view that there is so much rock in Back Bay, and in very many cases near the surface, that it would be quite impracticable to use a suction cutter dredger on a large scale "?

A.—Yes. Then we got a number of borings taken, and apparently taken reliably. We got a report from the Chief Engineer telling us how delighted he is with Back Bay, how it is fine, sandy clay, and how there is enough material really in Back Bay to reclaim the whole of the area. We were very sceptical. We said : " We do not believe this, and you cannot go and alter the whole plan of operations and think you are going to get everything from Back Bay." So matters proceeded; but the Chief Engineer was so enamoured of Back Bay that he seriously proposed to his Director that we should concentrate on Back Bay. I have heard since about the borings, and I really have serious doubts as to whether the borings were taken. They are absolutely unreliable. Still, you have the Chief Engineer, a man of responsibility, who comes and says : " Look here, here are all these borings; here are 25,000,000 yards of most suitable material for this dredger, and a nice sandy clay."

Q.—I think we now understand the circumstances under which the " Kalu " went into Back Bay, and I am much obliged to you for your explanation.

A.—Thank you.

Sir H. Courthope-Munroe.—We have heard nothing about the samples which have been produced.

Chairman.—Would you like to say something about them?

A.—I would like to say something about this stiff unctuous clay. (*The witness held up a glass in his hand containing some substance in water.*) This is stiff unctuous clay after it has been for, shall we say, half-an-hour in a glass of water. There it is. That is just what describes it—it is stiff unctuous clay, thoroughly suitable for a dredger designed for soft clay.

Q.—But as the dredger cuts it it is cutting a closely compacted material?

A.—You may take it from me that the material is naturally harder than this; the material when the dredger cuts it is very like a cheese; it could not be anything else.

Q.—Does it come out at the discharge end of the pipe in that fashion?

A.—It comes out at the discharge end of the pipe like that. It is rolled round and round as it comes out. It comes out sometimes in balls, balls of clay that you can squeeze like that. I should call it stiff clay but soft clay. Many times I have been to the end of the pipe-line and taken out the balls and you can squeeze them together. Here it is after a little water has been added.

Q.—That is the sample brought from Bombay?

A.—Yes. But now I would like you to see a piece of this material. This is as it comes out of the dredger. I have seen this material coming out of the dredger. This is the way it comes out of the dredger. It is all melted up. The cutter of the "Sir George Lloyd" cuts off the material perfectly, but because it is so hard it does not get along the pipe-line at the rate of 2,000 cubic yards an hour.

Q.—It does not cut it at such a rate, but it can get it along?

A.—No, it can cut it at that rate.

Q.—Surely it is the cutting quite as much as the friction through the pipe that reduces the rate?

A.—No, I should say the "Sir George Lloyd" could cut this all right.

Q.—Could cut it at such a rate as would deliver 2,000 cubic yards?

A.—Yes; you can see it here yourself.

Sir Frederick Hopkinson.—There is nothing unusual about all this.

Chairman.—This No. 2 is stiff unctuous clay. The other is the clay from No. 3 on the sketch of Sir George Buchanan.

(*Adjourned to to-morrow morning at* 11 *o'clock.*)

The Committee Assembled at 11 a.m. on the 29th October, 1926, all the Members being present.

Sir George Buchanan, re-called and further examined.

Chairman.—Have you got a piece of that grey material which you handed in yesterday—the clay?

A.—I do not know whether it is here, but it is available.

Q.—Might we have a piece of it? Will the gentleman produce it? (*The material was produced.*) Who is going to prove that, Sir George?

A.—Mr. Settle.

Q.—Yesterday you mentioned that Mr. Kidd had spoken of the clay as soft clay. On Page 61 of his typed evidence I find the following passages:—"(Q.) As far as your information, your survey and your borings go, can you say that the material in the harbour is soft clay and not hard clay?—(A.) I have never described it as soft clay. I do not agree that it is hard clay, but I have never described it as soft clay. (Q.) You described it as stiff clay?—(A.) Stiff and unctuous." Then the questions go on to the dredger.

A.—May I make any remarks now?

Q.—I was just going to give you this last question, and then invite your answer. Mr. Billimoria says, "Therefore, if they"—that is, the dredger builders—"were supplied with a specification to build a dredger for soft clay, that dredger could not be expected to get out hard clay." Then Mr. Kidd makes this answer—"Or even stiff clay. (Q.) In that respect, therefore, the specifications would be absolutely incorrect? —(A.) If the specifications said it was soft clay, they were absolutely incorrect." That is Mr. Kidd. Now, Sir George, would you deal with that. Would you like to have the quotations before you? (*Handing document to witness.*)

A.—Well, Mr. Chairman, I tried yesterday to convince you that there was nothing inconsistent in a stiff material being a soft material, and I must emphasise that. I maintain that Mr. Kidd's stiff unctuous clay is soft clay, and it is not capable of any other interpretation. I may say that " stiff unctuous clay " is a nomenclature invented by Mr. Kidd, because I have never before heard of any material called stiff unctuous clay. Let us just analyse the word " stiff " for a moment. I have been puzzling about this, Mr. Chairman, since we left last evening, and I have looked up the word in the dictionary, and I also looked it up in Mrs. Beeton's cookery book. Now, " stiff " as regards paste. You have a stiff paste. Mrs. Beeton's cookery book says, " Rub the butter into the flour, add the sugar and mix the whole into a stiff paste." You also have a stiff jelly, but it does not mean it is hard. In the Oxford dictionary it says, moist clay, batter, etc., thick and viscous, not fluid, in or approaching the plastic state. I assert most positively, Mr. Chairman, that " stiff and unctuous clay," which, as I say, is a name invented by Mr. Kidd, is soft clay for all practical purposes, and nothing will induce me to express any other opinion.

Q.—Then, in your view, when you are dealing with clay as a substance, " stiff " and " soft " are interchangeable terms. Is that it?

A.—I would not go so far as that.

Q.—Does it mean that it does not matter which word you use; whether you say the clay is stiff or the clay is soft, both are correct?

A.—As regards the material we are discussing, it does not matter whether you say " stiff " or whether you say " soft." I say you can use one or the other. After all, there are many words in the language, and some of us use one word and some use other words. I maintain that it is soft clay.

Q.—We were dealing with the " Kalu " when we left off last night, and we were on the question of cost. I just want one more figure from you. We know from the cost accounts which have been taken out that that season's working of the " Kalu " cost in wages and fuel and stores and sundries and things of that kind, 2 lakhs 42571 rupees. That is roughly £18,000, is it not?

A.—Yes.

Q.—That emphasises your criticism, does it not, that this was a terrible waste of money?

A.—It does, yes.

Q.—Had you ever hoped that the " Kalu " would go into Back Bay and settle down on the sea bed?

A.—On the borings, I do not see any reason why she should not. I would like to put in this document, Mr. Chairman. Here are the borings which were supplied to us, taken by the Executive. You will see in those borings sand and clay, soft clay, sand and soft clay, sand and soft clay, sand and soft clay, sand and soft clay. In every instance there is sand and soft clay. No. 1 is 9 ft. 6 ins. of sand and clay.

Sir H. Courthope Munroe.—Had not you better give a copy of that to the Committee, Sir George? *

A.—This is the only copy I have. On these borings I saw no reason at all why the "Kalu " should not go in. It now appears that these borings are absolutely incorrect. We had a letter from the chief engineer saying : " The material is decidedly good. Even the worst material is a sandy clay." When they put the " Kalu " in apparently there was no sandy clay. Apparently they got on to some hard material. The borings were incorrect.

Chairman.—The material which they got into was very stiff?

A.—Very stiff, yes, but they never told me that.

Q.—In fact, the material into which they got is described by you at Page 35 of your report of 1924 as follows : " The material met with has proved to be very stiff "?

A.—Yes, but it was not, according to these borings.

Q.—Originally you had disbelieved in the policy of sending a dredger in to work in Back Bay, had you not?

A.—I was never enthusiastic about Back Bay at all.

Q.—You had expressed an opinion against sending a dredger in to work into Back Bay, had you not?

A.—I had, yes.

Q.—I want to get the history of this. Then you got those borings which you have just read to us?

A.—Yes.

Q.—And, on the assumption that those borings are correct, you alter your opinion?

A.—I alter my opinion, yes.

Q.—Then the " Kalu " goes into Back Bay with disastrous results?

A.—With disastrous results.

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* Copy handed in. See Appendix VII.

Q.—I pass from that, and come back for a moment to the limitation of area by the Port Trust and the Royal Indian Marine. I gather the reason why you never discussed the question of dredging either with the Port Trust or with the Royal Indian Marine was because from the documents you assumed that the matter had been settled between the Government of Bombay and the Port Trust?

A.—Yes.

Q.—Or at all events you may have assumed that the Government were the paramount power, and that if they wanted to dredge in Back Bay they would do so. It was one or other of those considerations?

A.—Yes. It never occurred to me for one moment ——

Q.—What did occur to you, Sir George?

A.—What occurred to me was, as you say, that arrangements had been made.

Q.—If arrangements were necessary, they had been made; if they were not necessary the Government, as the paramount power, would order the work to be done?

A.—Yes. I will give you one instance——

Q.—You need not do so.

A.—I would like to give you an example of another case. The reclamation works extended in front of a long row of buildings called Marine Parade. I raised the question with Sir Lawless Hepper. I said, " Have these people got no rights? Suppose you build your wall in front of them, and fill up, and build new buildings on the reclaimed land, what about these people's rights? Have you looked into it "? I have had experience of that kind of thing, and I know it is a matter of common knowledge that if you interfere with a person's approach to foreshore rights you get into trouble. I do not even know now whether that matter has been squared up.

Q.—But it never occurred to you (I am not putting it by way of criticism at all) to ask anybody whether the Port Trust and the Royal Indian Marine would raise any objection to the dredging?

A.—Never. For 20 years they had been discussing it.

Q.—But I suppose you will agree that, the bed of the sea being vested in the Port Trust, it was somebody's duty before announcing the decision, to have put that matter right?

A.—The Government is the paramount power, is it not?

Q.—Is it, with regard to the Port Trust who, by Act of Parliament, have this bed of the sea vested in them?

A.—It is not a matter I can discuss, Mr. Chairman.

Q.—I am asking you just generally. Does it not occur to you that, if that were the position, somebody clearly ought to have made it perfectly certain that the Port Trust would not intervene?

A.—Would not intervene. Sir Lawless Hepper, when it was pointed out to him (it is in my statement) said, " At all events it is not going to stop the Back Bay reclamation schemes."

Q.—I am sorry to take this matter piecemeal, but a passage has just been pointed out to me which I have overlooked. This is Sir Lawless Hepper's extract from your report to Government, dated 15th December, 1924. Indeed it was the passage I was, reading from a minute ago. Let us get it from that little book, the reports of Sir George Buchanan, page 37 at the top, " The ' Sir George Lloyd ' and ' Colaba ' were designed to discharge 2,000 cubic yards of soft clay per hour through 10,000 feet of 42-inch pipes. Last season the material actually dealt with was not soft clay, but silt and stiff clay." Are you not there drawing a clear distinction between soft clay and stiff clay?

A.—I must again point to my little sketch which I made yesterday. I think I said several times yesterday that the dredger in the first season was working in the third layer. That is what the stiff clay refers to. It was working in the third layer, and we have since instructed them to get out of that layer.

Q.—That does not really quite meet my question, which was: " Are you not, in that passage, contrasting soft clay and stiff clay as if they were two different matters? Will you take this copy of the document? (*Handing same to Witness.*) It is at the top of page 37. That is the only question I am asking you. The way in which you put it is " was not soft clay but stiff clay."

A.—It is very difficult for me, Mr. Chairman, years afterwards to analyse actual words. " Silt and stiff clay, with some sand and stones."

Q.—You do appreciate that I am trying to get from you everything you would wish to say? You have read, have you not, hundreds of documents such as engineering reports?

A.—Yes.

Q.—You are as familiar with them as you could possibly be. Just detach yourself from this case for a moment and imagine that you are reading that as the report of some eminent engineer. You see that he says, "The material actually dealt with was not soft clay but stiff clay." Would you not, in your own mind, consider that there was a difference in consistency, in specific gravity, and in density between the soft clay and the stiff clay?

A.—If you analyse these sentences, I agree; but I state facts. I say, irrespective of analysing these words, that you have silt; you have soft and stiff clay; stiff, unctuous clay and soft clay, and you have clay and sand and stones. If I was writing this again to-day, or if I had thought when I had written this, "Now, let me see, this is going to be analysed in several years time," I should certainly have written it differently. If you want my real candid statement it is that notwithstanding anything which is written, I happen to know what the material is: there is silt at the top; then there is stiff unctuous clay, which I will always say is soft clay, and then you get on to the moorum and clay and stones, such as we had a specimen of on this table last night.

Q.—Had the result, up to the 14th February, 1924, of the pumping operations in the harbour been satisfactory in your opinion?

A.—No. I could not call them satisfactory. You could not call them satisfactory.

Q.—It was obvious that, for the many reasons which you have given, the dredger was not giving her output?

A.—That is right, yes.

Q.—In your statement of 11th February, 1924, at the top of page 26, you say, "I believe I may say that the result up to date has been quite satisfactory." What about that?

A.—You must remember, Mr. Chairman, (I think I am right in saying it) that there had been no measurements taken then.

Q.—Just consider. Mr. Lewis was the gentleman sent out by you, and very highly recommended. Mr. Speirs was the dredging master. Mr. Lewis had said that every day the result of the previous day's soundings came into the office. Mr. Lewis must have known?

A.—He must have known, but he certainly did not——

Q.—But, as technical adviser and supervisor, ought not you to have extracted from Mr. Lewis exact information?

A.—This sentence says: "I believe I may say that the result up to date has been quite satisfactory. The material in the harbour has proved much harder than we were led to suppose. Actual reclaimed land can be seen and walked upon by anyone who chooses to go to Colaba." Taking that as a sentence, that is what we all believed. We were always talking about actual reclamation. I do not see anything inconsistent in it. When this was written, Sir Lawless Hepper, and all of us, thought it was satisfactory. The material in the harbour was good, and the actual reclaimed land could be seen. I maintain that it was not until much later that, by measurements, they found out what they had been doing per hour.

Q.—But they could unquestionably have found out on the 10th December, 1923, what the dredger had done on the 8th December, and similarly every other working day of that season?

A.—Well, they certainly did not.

Q.—I think you are right there, Sir George. Mr. Lewis could not tell us that in fact he had investigated the results of the soundings. That passage says: "I believe I may say that the result up to date." The result, surely, must include output?

A.—No. The idea at that time was to reclaim land. We were all obsessed with the idea that the silt would be full of water, and so on. I remember going with Sir Lawless Hepper and Mr. Lewis and others, and everyone was very pleased indeed with the land which was being reclaimed.

Q.—But surely the result that was promised to the people of Bombay was the reclamation of 1,145 acres in five years from the commencement of the pumping? That was the result promised was it not?

A.—That was the result.

Q.—When you use the phrase, "I believe I may say that the result up to date has proved quite satisfactory," would not anybody reading that be led to think that the output, as well as the quality, of the material were satisfactory?

A.—Well, all I can say is that when this was written we were all satisfied. Sir Lawless Hepper went over this report with me. He made no comment.

Q.—Have you read the reports of the Development Directorate?

A.—I cannot say that I have read them.

Q.—They make very curious reading, do they not?

A.—There are so many reports. I have not read them.

Q.—Sir Lawless Hepper has had to admit that every report of the Development Directorate dealing with this scheme has had material omissions?

A.—I had nothing to do with that.

Q.—You had nothing to do with that; Sir Lawless Hepper has taken on himself the whole responsibility for the authorship of those reports; but those reports, with the evidence as given by him, show there were designed omissions, and omissions which could only have been intended to mislead the public. You had no responsibility for them, and your reports, if I may say so, are in very different terms.

A.—I said yesterday, Mr. Chairman, that I would produce a letter showing the difficulty which we had in getting double shift. This is a letter from the Chief Engineer, Back Bay Reclamation Scheme, to the Secretary to Government, Development Department: "I forward herewith a copy of a telegram received from Messrs. Meik and Buchanan for information: 'Anxious about dredging. Have you made arrangements for complete staff for working double shift on all dredgers?' I would refer to my numbers 2432 of 30th June, 1924, 2672 of 22nd July, 1924, and 2673 of 22nd July, 1924, asking for arrangements to be made for the engagement of officers to complete the staff required, and would again point out urgency of immediate action being taken if the services of these men are to be obtained in time for the commencement of the dredging season."

Q.—What date is that telegram, Sir George?

A.—The telegram is not dated, but the date of the letter is the 24th July, 1924.

Q.—Was one of the minor difficulties encountered the inability of the anchors and insufficiency of the anchors to keep the pipe-line straight?

A.—Yes, it was. It was a minor difficulty.

Q.—In point of fact, did the specification provide for one anchor of 7 cwt. for every four or five pontoons?

A.—I have not got the specification, but if you say so I will accept it.

Q.—I am taking it from the evidence. If you would like to check it, the reference is at page 12, line 6. Perhaps I had better read it to you. This is the evidence of Sir Lawless Hepper. He is being asked about the output of the dredger, and he is being shown that the addition of the figures for the first two seasons still gives a less figure than one working season; and of course he has to accept that. "(Q.) Then there must have been, both in 1923 and 1924, considerable interruptions and delays? —(A.) In 1923/24 the dredger did not commence until the 8th December, and then immediately after commencement there was bad weather, and considerable damage was done to the pipe-line. Throughout the season we had trouble, because the anchors that had been supplied for holding the pipe-line were not heavy enough, and the tides were very strong, and the pipe-line was continually getting out of position and breaking. It was not until we got a complete new set of heavy anchors that we were able to get the work going in the season." Then, at page 119, line 15, one of the technical witnesses takes up that matter. He is asked what were the various factors that combine to produce the very poor result, and he is asked to tell us all of them. It is said to him: "Is there any possibility of insufficiency of material?" and he says "In some cases. Other factors that we have to contend with are very strong tides, and this is an important factor. The difficulty especially is with the strong tide which keeps the dredger away from the face. Then there is difficulty also with the moorings of the pipe-line. They get carried away, and during the first two seasons we experienced considerable difficulty in keeping the pipe-line in position. We had to get a large number of extra anchors, the difficulty was so great. (Q.) Was that during your time?—(A.) Yes. Furthermore, to show the difficulty of holding the pipe-line in position in the original pontoons that we ordered there was one anchor allowed for every four or five pontoons, and that was absolutely useless. We have, on the later pontoons, allowed two anchors and winches to each pontoon instead of one for four or five, and even that has not proved sufficient." The gentleman who suggested one anchor of 7 cwts. for four or five pontoons must have made a miscalculation, must he not?

A.—Not necessarily, Mr. Chairman. These are all matters that are ascertained by experience. I remember discussing with Messrs. Simons & Company the question of the anchors to be put on the pontoons. In a dredger that I had worked in Burma with 5,000 feet of pipe-line, we had an anchor on each pontoon. Actually in working the dredger we found we did not want the anchors—that the pipe-line adjusted itself to the

tide. There was a strong tide, and I think we only had three or four anchors in the whole length of pipe-line. I say, Mr. Chairman, that this is a minor point in regard to which you cannot lay down any law beforehand. The man in charge of the dredging, when he found he wanted more anchors, ought to have gone round Bombay and got more anchors. What I suppose happened was the usual Government procedure. He had no power to buy an anchor. He would have to write to the Superintendent of Dredging, and he would have to write to the Chief Engineer; the Chief Engineer would have to write to Sir Lawless Hepper, and Sir Lawless Hepper, if it was within his own powers, would sanction it, but if not, it might go up to the Hon. Member. It takes a very long time to purchase necessary articles when you are working under Government control.

Q.—I am not on the question of time at all. I am on the question of insufficiency of the number of anchors and insufficiency in weight. The anchors that were supplied subsequently were 30 cwt. anchors. You had joined in the specification with Sir John Biles, had you not?

A.—Yes.

Q.—That specification provided for one anchor of 7 cwt. to four or five pontoons. In practice it was found necessary to provide two anchors and winches of 30 cwt. each to each pontoon. Was not that a serious miscalculation in the specification?

A.—No, Mr. Chairman, I cannot agree.

Q.—Was it a miscalculation?

A.—No, I cannot agree. It was the ordinary procedure. You could not tell exactly how many anchors you wanted. The specification was the usual procedure. I call it quite a minor point that they wanted more anchors when the work started—quite a minor point. As I say, all they had to do was to get some more anchors. You cannot go and lay down cut and dried rules for dredging operations of this kind.

Q.—The Port Trust, or the Royal Indian Marine, must have had people in 1919 who had a good deal of experience on the strength of the tides?

A.—No; I do not admit that they would have any knowledge of the exact strength of the tides.

Q.—Let us consider it. Between 1908 and 1913 they had done dredging operations with pipe-lines on a very large scale, had they not?

A.—Yes, at Sewri.

Q.—The people who were employed in that had the same problem as the people on the "Sir George Lloyd," namely, of getting their pipe-line in position?

A.—Yes.

Q.—Did you ever go to the Port Trust, or the Royal Indian Marine, people and ask them how they had gone on at Sewri in 1919?

A.—No. The very last people I would go to would be the Indian Marine.

Q.—Why the very last people?

A.—After the experience I had had with the Indian Marine in Mesopotamia, in connection with the dredgers "Jinga" and "Kalu," I should not be likely to go to them for any information on dredging.

Q.—Do you mean they would not give it to you, or what?

A.—No, I did not think it was of any value.

Q.—Would you have considered the experience of the Port Trust, spread over five years of dredging, of any value?

A.—I should not consider it so valuable as the experience I had obtained myself in connection with pipe-line dredgers. After all, we consulted the builders. Mr. McMurray had been actually in charge of the dredging on the "Jinga" and "Kalu." As a matter of fact I do not know what anchors they had there.

Q.—But do you think, Sir George, that the spending of 12 days in Bombay from the 19th May to the 31st May gave you sufficient time to study local conditions?

A.—Yes.

Q.—You do?

A.—It gave me ample time.

Q.—You left, however, without any personal knowledge of the quality of the material at the bed of the sea?

A.—If you mean that I did not go and dig up the material myself, you are perfectly correct.

Q.—I am merely using your own words. You have yourself said in your statement that you had no personal knowledge of the quality of the material at the bed of the sea, and this is right, is it not?

A.—That is perfectly right, Mr. Chairman, but you must qualify it by saying that if I had taken 1,000 borings I could not have obtained any more information than I had already obtained from Mr. Kidd's borings.

Q.—If you had taken 10 borings, would you not have been able to satisfy yourself whether the silt or mud, as it has been described, would make good reclamation—10 borings?

A.—No, I do not think so.

Q.—With 10 borings you could have brought up silt from various places in the harbour. That is right, is it not?

A.—Yes.

Q.—You could have had them tried out; you could have submitted them to Mr. Mitchell, or to any other expert; you could have examined them for yourself and have seen whether, in your view, the silt would make good reclamation. That could have been done, could it not?

A.—I think it would have been superfluous.

Q.—But it caused you a great deal of anxiety later, did it not?

A.—It does not cause me any anxiety now.

Q.—Did not it cause you at one time a great deal of anxiety?

A.—Certainly, it caused me anxiety at the time to know whether the silt would dry out properly.

Q.—Right through your reports, from 1922 to 1924, are not you emphasising the fact that you did not know the nature of the material and that the nature of the material never would be known until actual dredging commenced?

A.—The nature of the material now——

Q.—No, do answer the question first. Are you not, throughout your reports of 1922, 1923 and 1924, making it clear that you had no personal knowledge of the nature of the material, and that exact knowledge of that material would only come when actual dredging operations commenced?

A.—Certainly; but you must remember that I did go down and very carefully examine the reclamation at Sewri, which is the same material.

Q.—When did you do that?

A.—I did it between the 12th and 19th. I did it when I was in Bombay.

Q.—19th to the 31st, you mean?

A.—Yes, certainly.

Q.—Did you have any discussion with any representative of the Port Trust or of the Indian Marine, who was then connected with the Sewri reclamation?

A.—I had a great many discussions. I cannot remember them in detail now. I had a great many discussions with Mr. Messent, and I got a great deal of information from him.

Q.—Did you attach importance to the information he gave you?

A.—Certainly. I attached importance to the information which he gave me.

Q.—Am I right in saying that there is not any mention in your report of any conversations which you had with Mr. Messent?

A.—We do not put all those sort of things in. Why should I put it in my report?

Q.—Am I right in saying that in no correspondence which has been laid before us, or in any letter that you have ever written to the Director of Development, has it ever been mentioned that you had had interviews and discussions with Mr. Messent?

A.—No; we do not put records of the private conversations which we have.

Q.—But the point is this, Sir George. When Mr. Lewis began to raise the question about the quality of the material in the harbour, you and he had considerable correspondence about it, did you not?

A.—Yes, and I said, " At all events, it cannot be worse than at Sewri."

Q.—Would it not have been natural, when Mr. Lewis was putting forward the opinion of Mr. Mitchell, for you to have put forward the opinion of Mr. Messent, and to have said, " It is all very well, but I had endless conversations with Mr. Messent, who knew more about it than anybody else, and he assured me of the quality of the material."

A.—It was really more to the point, Mr. Chairman, if I may say so, to say, as I did say, that at all events the material cannot be any worse than it is at Sewri. I constantly looked at the material at Sewri.

Q.—Very well. I will ask you what I hope is the last question about stiff and soft clay, and it is this. Can you point to any document of any date you like made by the Development Directorate, the Government of Bombay or the Government of India—any document official or non-official—which uses the words " soft clay," before 12th September, 1919, when Messrs. Simons used the phrase?

A.—No, I cannot point to any.

Q.—I have looked through all the papers very carefully and I cannot find it either. As far as the documents before us go, and all the official reports and everything, the

very first mention which I can find of " soft clay " is in Messrs. Simons' letter of 12th September, 1919. If you can find anybody ever having described that material as " soft clay " before, it would be a very great help to the Committee?

A.—No, I cannot.

Q.—Very well. Now at page 35 of your statement we get to the point where, having completed your report, you arrived in Bombay on the 14th November, 1919?

A.—Yes.

Q.—Did you stay at Government House?

A.—I did.

Q.—For about how long?

A.—I think I was there for five or six days.

Q.—That would give you ample opportunity for discussion with Lord Lloyd?

A.—Yes.

Q,—Did you and he go over your report together?

A.—I really cannot remember that.

Q.—Even if you and he did not go over the report together, obviously you and he were discussing the substance of your report and the feasibility of the scheme.

A.—Yes.

Q.—No doubt you impressed upon Lord Lloyd the feasibility of the reclamation from an engineering point of view?

A.—Yes.

Q.—And impressed upon him also that the proposed work could be done for 367·61 lakhs?

A.—Yes, undoubtedly I must have told him that.

Q.—And that it could be done within the period stated by you in the report?

A.—Yes. I saw no difficulty at that time in completing it within that period.

Q.—Did you point out to Lord Lloyd at any of those interviews the possibility that there were difficulties ahead?

A.—No, I do not remember pointing out specifically what difficulties there were ahead, but it was generally understood, I think, that you cannot carry out any very large public work without having difficulties ahead. I think Lord Lloyd emphasised that himself.

Q.—He did?

A.—I do not think we discussed specific difficulties.

Q.—If there were 10 per cent. of delay in time and 10 per cent. of increase in cost, nobody would trouble about a thing like that, would they?

A.—Certainly not, on the figures which they expected to get at that time from the land.

Q.—But this is something a good deal more than 10 per cent. increase in time, is it not, Sir George?

A.—This is more than 10 per cent. increase in time.

Q.—And must be more than a 10 per cent. increase over your estimated cost of 367 lakhs?

A.—Yes.

Q.—On page 36 you are referring to your report : " I said that on the assumption that Mr. Kidd's borings and surveys were correct (and I saw no reason to doubt their accuracy as a great many borings had been taken), I accepted his conclusion both in respect of quality and quantity of material. In this I consider I had full justification, as I do not believe any responsible engineer in the face of such overwhelming evidence as to the nature of the material would be so foolish as to say he wished to take up another year's time (to say nothing of the expenditure involved) in making fresh investigations." That is how you put your case as regards that point, is it?

A.—Yes.

Q.—In point of fact, certainty could have been arrived at in far less than another year's time, could it not? You told us so yesterday?

A.—Certainty? No, Mr. Chairman. There was the monsoon. You could not do any boring in the monsoon.

Q.—I have been careful, if you notice, to suggest to you the date for the commencement of your borings—October, 1919. I am going now to suggest to you that it would have been prudent for you to have advised Lord Lloyd to have taken borings for a period not exceeding one month, and that if that had been done you would then have known with certainty the nature, quality and approximately the extent of the material to be dredged?

A.—I am sorry to say I do not agree, Mr. Chairman. I am perfectly satisfied.

Q.—At the bottom of page 36 you say: 'Finally I submitted plans, specifications and tenders for dredging plant by British firms; also an analysis I had prepared of the working cost of the dredgers. I modified and very considerably cheapened a section of the wall proposed by Mr. Kidd for reasons given in my report.'' Mr. Kidd had estimated that the sea wall would cost 64.22 lakhs?

A.—I will take that figure.

Q.—It is in your report; you may take it as being correct. You estimated it to cost 118.11 lakhs. At present some 1,850 feet is uncompleted?

A.—Yes.

Q.—Have you followed the evidence enough to ascertain that the cost up to the present moment is in the neighbourhood of 200 lakhs?

A.—I am quite prepared to discuss that, Mr. Chairman. Yes, I accept all those figures.

Q.—That is quite double the amount for which you said it would be done, because we have to take into account the unfinished portion?

A.—Yes.

Q.—What was the section of Mr. Kidd's wall that you considerably cheapened?

A.—As far as I remember, we adopted a rubble mound instead of concrete blocks. I cannot remember now precisely.

Q.—One object of the sea wall, of course, was to retain whatever material was pumped into it?

A.—Yes, within reason.

Q.—If the material which was pumped in was not worth retaining it was not worth pumping?—

A.—Yes.

Q.—Did your sea wall in fact retain the material?

A.—There are a number of questions involved in that. I am not prepared to answer that question without being allowed to elaborate it.

Q.—Have you any doubt, Sir George, that you are allowed to elaborate any question that you wish? Have you any doubt about that?

A.—No.

Q.—Then come along. First of all, did the sea wall in fact permit large quantities of the silt to escape through it?

A.—So I am told, yes.

Q.—Did not you see it yourself?

A.—I did not see very much of it.

Q.—Did you see any of it?

A.—I saw some of it, yes.

Q.—You saw some of it. That is the first point. The silt that was escaping through it was part of the material pumped by the "Sir George Lloyd"?

A.—Yes.

Q.—And believed to be, when you put in your report of October, 1919, good material for reclamation?

A.—Yes.

Q.—Your sea wall must have been designed to retain that material?

A.—Yes, it was.

Q.—Why did it not retain it?

A.—Well, there are certain reasons. I should think that construction had something to do with it.

Q.—Were you supervising the construction of it?

A.—No, I was not there all the time.

Q.—But you were there for two or three months each year, were you not?

A.—Each year, yes.

Q.—Is there any letter which you have ever written complaining to Mr. Lewis or to Sir Lawless Hepper or anybody, that they were building the sea wall in such a way that they were permitting the reclaimed material to escape?

A.—I shall have to look that up. There are a good many letters on the subject.*

Q.—Would you just make a note of it?

A.—I will.

Q.—As to whether you can find any memorandum or letter addressed to Mr. Lewis or to Sir Lawless Hepper or to anybody in control of the works criticising them for the way in which the sea wall was being built, and saying that in the result they would have reclaimed material passing out again into the open sea—something to that effect?

* See Appendix VIII.

A.—Yes. When we are inspecting works, Mr. Chairman, we do not always put down in writing everything we say to the engineers in charge.

Q.—Then I will put it to you in another way. Will you pledge your word that you ever complained to Sir Lawless Hepper that the wall was being built in such a way as that it permitted the escape of reclaimed material?

A.—No, if you put it exactly in those particular words.

Q.—Yes, I do.

A.—No, I do not think I did.

Q.—Or to Mr. Lewis?

A.—Or to Mr. Lewis.

Q.—I am obliged to you.

A.—Not exactly in those words.

Q.—Anything in the nature of a complaint—a complaint that they were building the wall in such a way that it permitted the material to escape. I must put that particular point for a reason which will be apparent in a moment. You had contemplated, had you not, that your sea wall would allow material to escape through into the sea?

A.—No.

Q.—The silt is carried in suspension by the sea, is it not?

A.—It is.

Q.—Did not you write a letter to Mr. Lewis saying that the sea wall would be porous for a very long time to come?

A.—Naturally it would be porous. With the sea water going in and out you cannot make a rubble wall that is absolutely water-tight at once.

Q.—Your letter of June 3rd, 1922: "In any case the sea must pass through the porous rubble wall for a long time to come," means that the sea would go on passing through it despositing silt until the time when the wall became a retaining wall? Is that right?

A.—A rubble wall is not a watertight wall. As the reclamation proceeded the instertices would be filled up by the silt and the wall would gradually——

Q.—Seal itself?

A.—Would seal itself.

Q.—That is what I was trying to put, only I did not put it in that way. The silt being carried in suspension by the sea would be deposited gradually in the interstices of the wall and eventually would seal it?

A.—Yes; it would seal it.

Q.—It did become a very expensive matter, did it not? Do you remember an interview between Sir Lawless Hepper, Mr. Lewis and yourself within one month of the commencement of the dredging? That is early in January, 1924.

A.—Yes.

Q.—Did they tell you that the silt which was being pumped was escaping through the sea wall, and could, in fact, be seen on the seaward side of the sea wall?

A.—Yes.

Q.—Did they tell you later that of 1,020 cubic yards per hour that were dredged by the "Sir George Lloyd" there was found on measurement of the reclamation only 627?

A.—Yes, they told me that afterwards.

Q.—That is a loss of nearly 40 per cent., is it not?

A.—Yes. As I said yesterday, I do not accept any of the measurements at all.

Q.—If those figures were correct, was that serious?

A.—It was undoubtedly very serious.

Q.—In the season 1924-25 did they also tell you that of 856 cubic yards per hour pumped only 452 were found to be retained in the reclamation?

A.—Yes.

Q.—That is a loss of about 55 per cent., is it not?

A.—Yes.

Q.—Did they urge upon you the desirability of sealing the sea wall with moorum?

A.—I do not think they urged it upon me. I think we urged it upon them, as far as I remember.

Q.—It has been put quite the other way. It has been put that Sir Lawless Hepper and Mr. Lewis were both very anxious that that sea wall should be sealed with a bank of moorum, and that you thought it was unnecessary. Does that accord with your recollection of the matter?

A.—It accords with my recollection at that particular time; but I should like to amplify that, if I may.

Q.—Please do; but shall I just finish the questions on this, and then I would like you to deal with that. As a matter of fact, did not Sir Lawless Hepper obtain the sanction of Government in February, 1925, to the expenditure necessary for sealing the wall, and did not they, in fact, do it between February, 1925 and September, 1925?

A.—I do not think I was there then. I believe that something did happen, but I think it was on our representations, not on theirs.

Q.—When you say " on our representations " do you mean on the representations of your firm?

A.—Yes.

Q.—If so, that is a representation that would be sent by a letter from England to India?

A.—Yes.

Q.—Would you make a note that if you have got any letter of that character we would be very much obliged if we could have it?

A.—Certainly.

Q.—The letter would be somewhere about January, 1924, and later. Perhaps I can help you a little with regard to that. Will you just take again the large volume of correspondence? (*Same handed.*) At page 106 there is a letter from Mr. Lewis to Sir George Buchanan: " Undated, but must be January, 1924," and is a reference to the interview of which you spoke: " Dear Sir,—In a discussion in Sir Lawless Hepper's room a few days ago it was suggested that the rubble mound should be lined on the inside with a layer of quarry spoil to prevent any leakage of dredged material. Would you agree to have this spoil placed in position from the present time onwards? " The answer is the 24th January, 1924, on page 107: " I am not in favour of beginning at present the lining of the rubble mound on the inside with quarry spoil." The next letter to which I would call your attention is the 15th October, 1925, paragraph 3, on page 167: According to the figures given in your letter under reply, 1,261,986 cubic yards of material were dredged from the harbour during the last season, but only 680,438 cubic yards were deposited in Back Bay. The smallness of this latter figure obviously points to a great leakage from the area under reclamation, and the advisability is indicated of tipping a watertight moorum bank alongside along the inside face of the sea wall."

A.—Yes.

Q.—You were there suggesting in October, 1925, what had been impressed upon you in January, 1924, and with which you then disagreed?

A.—Yes, apparently.

Q.—In fact at the date of this letter of October, 1925, the Development Directorate had already completed the sealing of the sea-wall on their own initiative?

A.—Well, I would not like to say it was on their own initiative.

Q.—Subject to any document you can produce, at present the case does appear as though it was on their own initiative. Do you agree with that?

A.—I agree, yes.

Q.—Is there anything on this question of the porousness of the sea-wall further that you would like to say about it that would help us?

A.—Yes.

Q.—Thank you very much.

A.—At page 107 you read two lines of my letter: " I am not in favour of beginning at present the lining of the rubble mound on the inside with quarry spoil. I believe that later on, when the reclamation towards the wall is more advanced it may be desirable to put a lining on the inside up to high-water neap tides only." If later on, when I was not there, the people who were every day looking at the work saw material going through the wall and did not take any action at all, continued looking at it and continued taking no action at all, well I do not think I have any words too strong with which to blame them.

Q.—But this must, must it not, relate back to the design of the sea-wall, which was intended to preserve and retain all that was pumped into it? Is not that the original cause of the trouble?

A.—No, there are other ways of doing it. No one would expect to make a rubble wall which would take water. May I read what I was going to say?

Q.—Please do?

A.—The wall was properly designed.

Q.—Is that some document we have got that you are reading from?

A.—You will get a copy of this, I think. I do not think we have got copies at the moment.*

Q.—I beg your pardon.

A.—The wall was properly designed with small material—that is the run of the quarry—in the middle and the large stones outside. Properly constructed, the wall should have blinded itself in time, because the silt-laden water would have filled up the small interstices and made the wall watertight, though in the case of water with silt in suspension in the way that it was, as I shall point out later, much more drastic measures might have to be taken. Naturally, above the filling tidal water will flow through the wall. The wall was not built according to the plan and specifications. It really lay with the engineers in charge of construction. They had a specification and they had a plan, and I was not the executive and I was not always on the works. Here is the cross section of the wall, and here is the specification (documents produced).

Q.—Will you hand in that plan and specification?

A.—Yes. (Same handed in.)

Q.—We will mark them, and then they will be returned. If the wall was not being built to specification, as you were out there each year for two months or so, why did you not intervene?

A.—If I went out after they had done six months' work, I could not see with my own eyes exactly the size of the stone they put into the interior of the wall. We were always instructing them to put the run of the quarry in the middle of the wall; and that will be supported by Mr. Halcrow, who will give evidence on that.

Q.—Supposing you were there on the 20th November, 1922, on the 20th November, 1922, they were building the wall?

A.—Yes.

Q.—You could have gone down and seen the stuff being brought from the quarry, seen it being tipped, and seen the whole operation?

A.—I did. I constantly did see it.

Q.—Did you ever complain to Sir Lawless Hepper or to Mr. Lewis that they were not building the wall according to the specification?

A.—Yes.

Q.—You took exception to the size of the stones on one occasion, did you not?

A.—Yes.

Q.—Is there any document you know of in which it has been stated that they were departing from the specification?

A.—There is a document in which we said that we wanted the run of the quarry. We did not want them to divide it up, but we wanted the run of the quarry in the middle. I think that was with reference to Mr. Halcrow's inspection.

Q.—Is there anything further on that point that you would like to say?

A.—Yes. When the dredging started, I have already described to you how pleased we were with the first year's dredging, and we were getting material—I dare not use the words " hard " or " soft."

Q.—But we must have the word that you used—you said hard material?

A.—I thought we would not go into that again.

Q.—That is the word.

A.—Whatever it was, the material was particularly good, and so far as I could see —I remember this occasion—very little was being lost through the wall. On the occasion when I was asked if certain blinding could be done, in that letter you refer to, I remember pointing out that I would rather have the material elsewhere. I cannot remember all the details, but I do remember distinctly on several occasions—I do not think it is in writing—that I pointed out to Mr. Billington and Mr. Lewis, and I think to Mr. Brims—but of that I cannot be certain—that if there was material which was escaping anywhere, it was down a large storm water drain, and that this should be closed. When at a later date it was apparent to the engineers on the spot, who were looking at the work all day, that there were actually large quantities of the material escaping through the wall, surely it was their obvious duty to take action. I understand that Mr. Brims, the Superintendent of Dredging, asked repeatedly that this should be done, but he was refused sanction by Mr. Elgee, the Chief Engineer; and we will bring evidence on that point when Mr. Settle gives his evidence, because Mr. Settle reports that when he went to Bombay in 1924, the very first thing he did was to call attention to the material going through the wall, and said: " Now why do not you do something? " And that he had great difficulty in getting anything done. But you will hear Mr. Settle on that point. Then to show how we thought about the material, originally we intended to divide the reclamation area by putting in a number of cross-

* See Appendix VIII.

walls. In my report, dated 10th January, 1923, I said with reference to cross-walls: "The Chief Engineer of the Reclamation Branch has allowed for eight cross-walls against our four, the amount of stone involved being equivalent to that required for the whole of the sea-wall. Until the nature of the material dredged is actually seen"—so we come to that again, that is to say, whether we are getting water with silt in suspension, or whether we are getting water with balls of clay, or what we are getting—"it is impossible to say how many walls will be required, and it may be necessary to divide the area into still smaller sections. But I hope by using moorum in conjunction with stone that a saving in the latter may be effected." In the report dated 10th January, on seeing the material, I reduced the number of cross-walls to two, and proposed to use for dividing up the area the storm-water drains. Obviously, when the Chief Engineer and Superintendent of Dredging saw what was practically the water with silt in suspension flowing through the wall, they should at once have increased the number of bunds and made settling tanks, as I had contemplated. I said that it may be necessary to divide the area into still smaller sections. You might have a big area and make a series of settling tanks, and experience will teach you what to do. But to think the engineers, because on this one occasion when, as I say, there was practically nothing going through the wall, and I saw the material—I remember distinctly telling them that I did not think at that particular date they need do anything—should for two years afterwards do nothing at all, and then hold up their hands in horror——

Q.—It is one year from January, 1924?

A.—Yes—and hold up their hands in horror and say it is impossible, and take no action—well, I have no words too strong in condemnation of, as it seems to me, such strange conduct.

Q.—Is that all you have got to say about the sea-wall?

A.—Yes.

Sir H. Courthope Munroe.—May I just correct a date? I think the witness stated that Mr. Settle went to Bombay in December, 1924.

Chairman.—Did he say that?

Sir H. Courthope Munroe.—In point of fact, I am told by Mr. Settle it is 1925; I do not want to get a mistake in the notes.

Chairman.—December, 1925.

Sir H. Courthope Munroe.—Yes. Later on we may get into a difficulty.

Chairman.—Yes; it becomes of importance.

Sir H. Courthope Munroe.—December, 1924, should be November, 1925.

Chairman.—Will you correct that, Sir George?

Sir H. Courthope Munroe.—The date you have given has been given in error; the real date is November, 1925.

A.—Yes. That is for Mr. Settle.

Chairman.—There is one passage in that statement I would like to ask you a question about. You said you came to the conclusion that a large amount of this silt was escaping through an old storm water drain?

A.—Through a storm water drain.

Q.—Was it an old one or one that was put in by the reclamation people?

A.—One that was being put in by the reclamation people.

Q.—But no storm water drains were put in before 1922, surely?

A.—Yes, there was one being put in.

Q.—Do you mean a little one?

A.—Yes; there was a culvert.

Q.—Is *this* the one you are referring to—that little one?

A.—That is the one. There was a hole in the wall, I remember.

Sir Frederick Hopkinson.—It was not done till 1923.

A.—There was certainly a hole in the wall; in 1923 the wall was built.

Chairman.—We can check this afterwards. I just want to get your evidence on it. Do you say there was a hole through the wall through which the storm water drain would pass?

A.—Yes.

Q.—Out into the open sea?

A.—Out into the open sea.

Q.—In your view a large quantity of silt was escaping through that?

A.—Through that hole in the wall.

Q.—You said that was one of the storm water drains constructed during this reclamation?

A.—Certainly. I do not know how many lineal feet of the drain had been made, but certainly I remember looking at the hole in the wall.

Q.—What date are you fixing for this? Is it January, 1925?

A.—I am fixing it at the date of——

Q.—The interview?

A.—At the date of that letter.

Q.—Letter 107?

A.—Yes.

Q.—That is January, 1924?

A.—Yes. I say that there was a hole in the wall in January, 1924, through which there was silt and storm water escaping; I have it distinctly in my memory. There is no record of it, but I remember distinctly saying, " There is water going through, but what is going through the main wall is insignificant."

Q.—By January, 1924, it is probable that there was a storm water drain passing through that sea wall. I think one can satisfy oneself about that by looking at some papers?

A.—Yes.

Mr. Billimoria.—Where was the hole? Was it in the middle, in the top, or in the bottom?

A.—It was in the bottom of the wall.

Q.—Did you take any steps to rectify that at once? A hole in the bottom could be easily filled in.

A.—I had no power to take steps. I say that I remember pointing it out to the Executive.

Chairman.—As a matter with which they should deal?

A.—Yes. I remember incidentally discussing it on the ground.

Q.—As the supervisor of the works it would be part of your duty to point that out to them?

A.—Yes.

Q.—It being pointed out to them as a real cause of the loss of the material, it was their duty to fill it up?

A.—Yes.

Q.—And later on, perhaps, it was your duty to see that they had done it?

A.—If I happened to be in Bombay.

Q.—On page 38 of your statement you say: " On the 24th November, 1919, on instructions from the Bombay Government, and accompanied by the Secretary to the Government, I proceeded to Delhi to discuss the scheme with the Government of India, and had a series of conferences with the member of the Council concerned, the Finance Member, and the Secretary to the Government of India Public Works Department." What was the name of the Secretary to the Government who went with you?

A.—I rather think it was Mead.

Q.—He is now dead?

A.—Yes.

Q.—Then you had a series of conferences with the Member of the Council concerned —who was he?

A.—Sir Claude Hill.

Q.—And the Finance Member?

A.—The Finance Member also.

Q.—Who was the Finance Member?

A.—The Finance Member was the officer who is now Governor of the Punjab.

Q.—Sir Malcolm Hayley?

A.—Yes.

Q.—And who was the Secretary to the Government of India Public Works Department?

A.—That was Sir Sydney Crookshank.

Q.—Those are four officials?

A.—Yes.

Q.—Had any one of them any personal experience of suction dredging, do you imagine?

A.—I cannot speak for Sir Sydney Crookshank, but I cannot believe that Sir Claude Hill or Sir Malcolm Hayley had any experience of suction dredging.

Q.—Or Mr. Mead?
A.—Or Mr. Mead.

Q.—Or any idea of how to set about building a sea wall?
A.—No, I do not suppose that they did. Sir Sydney Crookshank ought to have.

Q.—Have you read his evidence?
A.—Well, I really have not had time.

Q.—You may take it that he disclaims any knowledge of anything about suction dredging, and would not be offended if one put his knowledge of these matters as most superficial. If you expressed to those four gentlemen any opinion about the output of dredgers, weight of anchors, forces of tide, percentage of solid material passing through the pipe, or any of those technical matters, of course, none of them would have dared to say anything in contravention of it, would they?

A.—I would not say that of the Chief Engineer. The Secretary of the Government of India Public Works Department is supposed to know everything about engineering—every branch of it.

Q.—Is he supposed to know about marine engineering?

A.—He is supposed to be able to have access to people who do know, in the marine engineering branch. I put it in this way to you : I do not know whether they do it now under the Government of India Act, but certainly not so many years ago all marine works went up to the Secretary of the Government of India Public Works Department. They were frequently very severely criticised, and they assumed a complete knowledge of the subject.

Q.—Lord Lloyd has expressed the opinion (I am going to put it to you as a very fair way of meeting it) that they would be very largely in your hands. I am not suggesting anything improper at all, but you were the expert. You were the man known to them as having done work in Rangoon and in Mesopotamia, and had obtained a Knighthood and the K.C.I.E., and have been all your life an engineer. Would not that put them very greatly in your hand?

A.—It would depend upon the temperament of the men; it depends very largely on the temperament of the men. When I was carrying out the river training works in Rangoon, there was an officer at the head of the Public Works Department who was very different in temperament—I say it without any disparagement to Sir Sydney Crookshank—and he and I disputed for four or five years before the river training works were begun; so that I say it is a matter of temperament. Some Secretaries might say : " Well, I do not know about this," and others might argue the point. I do not think it could be laid down as a rule.

Q.—Sir Sydney Crookshank did induce you to increase the dredging cost from 6 annas to 8 annas, did he not? Do you remember that?
A.—I do not remember that.

Q.—Was your figure always 8 annas?
A.—I think my figure was always 8. I remember that as my completed estimate was increased from 367 lakhs to 400 lakhs.

Q.—Did Sir Sydney Crookshank at the interview you had with him at Delhi go into the matter as a man understanding it, as a man of any degree of quality, with you?
A.—He has his technical staff. I cannot say that he devoted very much time to personally discussing the matter with me. An officer in that position has his technical staff. I did not know what inquiries they made or what action they took. It was open to Sir Sydney Crookshank to take any action he liked to ascertain whether my plans and estimates were accurate or not—in fact, I go further and say, that it was his duty to do so.

Q.—Did he make any criticisms whatever upon the text of your report?
A.—I do not know; I do not remember that he made any.

Q.—Or on the feasibility of the scheme?
A.—No, I do not think he made any criticisms to me.

Q.—Or the fact that the work could be done at 367·61 lakhs?
A.—No, I do not remember that he made any such criticism.

Q.—Can you suggest any criticism that Sir Sydney Crookshank made of your scheme, or any useful contribution that he made?

A.—I have never seen Sir Sydney's report on the subject. I am hardly in a position to answer that question. I have seen no report.

Q.—We have not seen it.

A.—I have seen no report, so that I really do not know what he said or at what length he commented on anything.

Q.—When you were discussing it did he make any useful comment that you remember—any comment showing that he was bringing a skilful and trained engineering mind to it? That is what I want to know.

A.—I cannot remember that he made any very useful comment.

Mr. Billimoria.—You say in this paragraph that you left Bombay on the 24th November, and returned to Delhi on the 29th November. If you left on the 24th you would not have reached Delhi until about the night of the 25th; that would be the earliest at which you could reach Delhi?

A.—Yes.

Q.—So that you would not have any interview with Sir Sydney Crookshank before the 26th?

A.—If I left on the 24th November?

Q.—I am reading your paragraph 47.

A.—Yes.

Q.—So that you would not have discussed the proposition with Sir Sydney Crookshank before the morning of the 26th?

A.—Excuse me one moment; I should have to think of the train I left on the 24th by, and the time I got to Delhi. I think we started the discussions as soon as we arrived. I remember having discussions in the evening with Sir Claude Hill. I really cannot answer that question without looking at the time tables and finding out what time I arrived.

Q.—I can tell you no train arrives in Delhi before 8 o'clock in the evening, so that it would not have been possible for you to have discussed the proposition except at the dinner table, if you were dining with Sir Claude that night?

A.—This is the 25th?

Q.—Yes, the 25th.

A.—Very well, then, we had the 26th and 27th and 28th. I rather think the train leaves on the 29th at midnight from Delhi to Bombay.

Q.—Do you think that a discussion of four days with the Secretary of the Public Works Department would enable him to go through your estimates thoroughly and to express any opinion thereon?

A.—It was not for me to say how long I was to be in Delhi, but as soon as the officials in Delhi told me that they had received all the information they required, I left Delhi. If they had wanted me to have stayed a long time in Delhi I would have stayed a long time in Delhi.

Chairman.—The theory probably would be that they had papers laid before them, and then when they were ready they would send for Sir George.

Mr. Billimoria.—That could not be, because Sir George in his evidence has said he brought the report out to Bombay although it is dated September. He brought it out from England, but it was not sent over.

Chairman.—We must be a little careful about this. The report was in existence in September and it was laid before the Government of Bombay in October. If it was sent to the Government of India it could easily reach them in the month of October. It is on the 24th November, three weeks later, that Sir George has his interview, so that there was plenty of time for the Government of India to instruct itself before sending for Sir George.

A.—I should like to make it plain that it was no business of mine to dictate to the Government of India how long they would consider my report. As soon as they said they did not want me any longer I naturally left Delhi and returned to Bombay. I did not go of my own free will.

Q.—At all events, did you give to the Government of India as much time as they wanted you to give for the discussion of this matter?

A.—I gave them all the time they wanted for discussion. I had no desire to hurry anything.

Q.—All I am suggesting to you is that three of these people had no expert knowledge, and one had not sufficient expert knowledge of these highly technical matters to be on any real equality with you in the discussions. At page 39 you say : " Sir George Lloyd said definitely and repeatedly that he did not wish the work to be carried out by the Bombay Public Works Department. On the 3rd December, 1919, I submitted a note giving my views as to the execution of the work on the supposition that my firm would be the engineers." Can you tell us if you have it in your recollection, what was the point that Lord Lloyd made with regard to the non-employment of the Public Works Department?

A.—As far as I can remember, Lord Lloyd's idea was to have the work done free from, what shall I call it? the incubus of Government control—free from the intolerable

delays caused by having to ask sanctions every day, and meeting audit objections; then there was the lack of costing, and generally the procedure which is inevitable in carrying out work under the Public Works Department. Sir George Lloyd discussed it with me several times, and his idea was to be free from these restrictions.

Q.—To create a body that would be more elastic and quicker in procedure?
A.—Yes.

Q.—At that time there was no idea of the Development Directorate. That came subsequently. At that date I think it must have been in Lord Lloyd's mind to create a body of that character, because we have had it in evidence that in January, 1920, he was discussing it with Sir Lawless Hepper. Of course he may not have mentioned it to you?
A.—He did not mention it to me. My recollection of the way in which he discussed the Back Bay scheme was that, at all events at that date, he had not contemplated the Back Bay scheme being merged in the Development Directorate. He may have had the Development Directorate in his mind, but he had not contemplated merging the Back Bay scheme into it.

Q.—In your view, was it an advantage to the Back Bay scheme to include it in a large number of other schemes for the development of Greater Bombay?
A.—No; I was always rather sceptical about it, and I never thought it was desirable for the Development Directorate to carry out the Back Bay scheme.

Q.—The other matters which were in the hands of the Development Directorate from the reports appear to have been immense—the development of Salsette and the building of chawls?
A.—Yes.

Q.—This was only one of many?
A.—It was one of several schemes.

Q.—Returning to page 39, you say: " On the 3rd December, 1919, I submitted a note giving my views as to the execution of the work on the supposition that my firm would be the engineers " : " At the time this memorandum was prepared the Bombay Development Directorate had not been created, and I understood my firm would be in sole charge and control, and that our resident engineers would be free from the numerous restrictions on the economical execution of work which obtains in India on works carried out by the Government." At that time what did you gather would be the extent of your responsibility if you were in sole charge and control? Would you, in that event, be practically in the position of a contractor?
A.—No; I do not think we should ever have been in the position of a contractor.

Q.—Practically?
A.—Not a contractor.

Q.—If you were in sole charge and control with your resident engineers, and so on, would not that be so?
A.—If the work is being done departmentally it does not necessarily mean that the engineers are contractors.

Q.—You mean you would have been in a commanding position—that you would have been able to discharge members of the staff, and done things of that character?
A.—Certainly we would have had control of the staff, and we would have known what the work was costing. In fact, we would have been in a very different position from that which obtained under the Development Directorate.

Q.—You then refer to the interview of the 24th December, 1919, at which you discussed the purchase of the dredger, and it was decided to despatch a cablegram to your London office asking for tenders for the construction of a dredger to be obtained from various dredger-builders?
A.—Yes.

Q.—Then on the 14th January, 1920, you, being in Burma, got a telegram saying that the Bombay Government had decided to appoint your firm the consulting engineers of the Back Bay scheme?
A.—Yes.

Q.—I think you got back to Bombay on the 18th February?
A.—Yes.

Q.—And on the 21st February you had an interview with Sir George Lloyd?
A.—Yes.

Q.—And discussed with him how the work could best be pushed forward, as he was very anxious to see a start made?
A.—Yes. May I hand you in an accurate list of the dates for all the years of when I arrived at and left Bombay?

Q.—That would be very useful for us to have. (*Document handed in.*) At the very first interview, when you saw Lord Lloyd in connection with this matter, did he impress upon you that the matter was an urgent one?

A.—He did, undoubtedly.

Q.—Again, on the 21st February, 1920, was he anxious that the work should be proceeded with as quickly as possible?

A.—He was always anxious that the work should be proceeded with as quickly as possible; but not having technical knowledge, he did not realise the extent of the preliminary work which one had to do.

Q.—Before you could show some results?

A.—Yes.

Q.—Equally in May, 1919, was he anxious to have your report at the earliest possible moment? When you were first asked to prepare a report on Mr. Kidd's scheme, was he anxious to have your report at the earliest possible moment?

A.—Well, he wanted to start the work before the next monsoon. I do not say that he specifically said: "Rush through this report and let me have it as soon as possible." He certainly did not do that; but he indicated that once the work was sanctioned he did not want to lose another monsoon.

Q.—That is right. So that that really meant that the report ought to be out at the end of the monsoon, if it could be done?

A.—Yes.

Q.—It was desirable?

A.—It was desirable.

Q.—I think it was on the 22nd February, 1920, that you learned that the Council had approved of your appointment?

A.—Yes.

Q.—Then it was Sir George Lloyd told you of his scheme for a Bombay Development Department?

A.—Yes.

Q.—Did you arrive in London on the 17th March, bringing with you a letter of introduction from Lord Lloyd to Mr. Montagu?

A.—Yes.

Q.—Who was then the Secretary of State for India?

A.—Yes.

Q.—Did you write a letter to the Private Secretary to Mr. Montagu, in which you say this: "I have had the advantage of discussing the subject fully with the Governor in Council, Bombay, the Government of India, and personally with Sir George Lloyd, and if the scheme is sanctioned by the Secretary of State His Excellency wishes no time to be lost in placing the order for the dredger, as it is necessary for everything to be ready to begin the reclamation as soon as the first section of the wall is finished"?

A.—That is correct.

Q.—The plan in your mind, if I may go to the map for a moment, was this. You were to begin the wall from the Military, Colaba, end?

A.—My very first idea was to begin it at Colaba.

Q.—And the scheme was to carry the sea-wall along to a certain point, and then shut in a lagoon by building a cross-bund?

A.—Yes.

Q.—So that you had an enclosed area composed of a section of the sea-wall, and at right-angles to it a cross-bund joining up with the land?

A.—I think before we got to that stage we had decided that, owing to transport difficulties, it would be preferable to begin the work at Marine Lines.

Q.—Anyhow, was the same plan to be followed? If you went to Marine Lines you would build this section of the sea-wall?

A.—Yes.

Q.—And then build a cross-bund?

A.—Yes.

Q.—Enclosing completely that little area?

A.—That is right.

Q.—As a matter of economy, you would naturally carry your sea-wall to an extent just beyond the point necessary for your cross-bund?

A.—That was the idea.

Q.—Otherwise you are putting too much money into your sea-wall?

A.—Yes.

Q.—You would go on with the reclamation in this block; and you would then at the same time be producing your sea-wall; and again, when you had reached a sufficient length, you would enclose the area by a cross-bund?

A.—That is correct.

Q.—But, again, having only just sufficient sea-wall to keep ahead of your reclamation?

A.—That was the programme of works; but, as I say, the very first idea was to start at Colaba, but transport difficulties were so great that before we had really got any plans out for Colaba we had decided that it would be much cheaper to begin from Marine Lines and proceed as you have described it.

Q.—In this letter of the 17th March you are intimating that the reclamation should begin as soon as the first section of the wall is finished?

A.—Yes.

Q.—By that you mean what I call the lagoon, the enclosed lagoon at Marine Lines end?

A.—Yes; I think it was at Marine Lines end.

Q.—Or either end?

A.—Or either end. That was the idea. The idea was that the work would be started on the wall at the end of that monsoon, so that considerable progress would have been made with the wall the following year.

Q.—You hoped, and indeed it was part of your plan, that the dredger would arrive at a time when one area, be it Colaba or Marine Lines, would be ready to receive the pumped material?

A.—Yes.

Q.—The two were to synchronise?

A.—The two were to synchronise.

Q.—They failed to do so, did they not, very badly?

A.—They failed very badly.

Q.—Why was that?

A.—Well, I think I can explain that in a few words.

Q.—I wish you would?

A.—I have pointed out to you that in the first instance it was proposed to begin at Colaba, but then we changed our plans owing to the expense of transport, and the proposal was then to begin at Marine Lines, and arrangements were being made to begin at Marine Lines. It was intended by the Bombay Government that the wall construction should be put in hand in October, 1920, and a contract was actually let in Bombay by the Bombay Government. I was not present and do not know the details, but a contract was let by the Bombay Government. It was subsequently cancelled and a resolution of Government passed that the work should be done departmentally. The work was not, therefore, begun till October, 1921, so that a whole year was lost in beginning the work because, instead of the work being begun in October, 1920, according to the original desires and wishes of the Governor, they decided not to accept that tender, and the work was postponed. Then in July and August there was correspondence between the India Office and myself on the subject of whether it would be possible to begin at both ends simultaneously. I think you have that.

Q.—I will deal with that as a separate matter, unless you would like to do it now. Let us see if we can shorten that. Is the substance of that that you received an enquiry from the Secretary of State here?

A.—Yes.

Q.—Asking whether it was practicable to begin the sea wall at both ends?

A.—Yes.

Q.—To that you replied that it was practicable, but that it would mean an increase of cost?

A.—Yes.

Q.—Am I right in thinking that on those documents, while you were saying it was practicable you were not enthusiastic about it, as it meant a complete change of plans? It meant an increased cost and an increase of plant?

A.—I do not know that I was exactly not enthusiastic about it, but as you know, the reason was given that they really wanted the land more urgently at Colaba than they wanted it at Marine Lines. That was emphasised later on by Sir Lawless Hepper.

Q.—We might take these telegrams and I will just read them, as they are short. There is a telegram from the Governor of Bombay dated the 4th July, 1920.

A.—Yes.

Q.—"Following for Buchanan. Telegram begins: Back Bay. His Excellency would be glad of your telegraphic opinion as to feasibility of beginning work at both

ends at the same time. Military authorities concerned in getting reclaimed land adjacent to Colaba, are anxious that Colaba end should be reclaimed as early as possible. On the other hand, his Excellency believes you considered necessary to start Western end first on account of railway communications." That is his telegram?

A.—I did not get that telegram, but I got it in the form of a letter.

Q.—The letter is the 7th July. The letter, though not setting the telegram out textually, gave you the exact substance of it?

A.—Yes.

Q.—Then in reply to that letter your firm suggested the following reply for transmission by cable to the Government of Bombay: " Buchanan reports that it is practicable to begin work on the Back Bay scheme at both ends simultaneously. In constructing the wall the bulk of the work would be carried out from the Western end, the stone being conveyed to the site by rail from quarries near Andheri, but a considerable length of wall could be built from the Eastern end, as the wall would be of concrete throughout, and sufficient stone could be procured locally. To begin building the wall in two places will not materially advance matters unless reclamation can also be proceeded with, and Buchanan is considering whether the new dredger and the ' Jinga ' "—was that a misprint for " Kalu "?

A.—Yes.

Q.—" —whether the new dredger and the ' Kalu ' can work simultaneously at Eastern and Western areas. Buchanan understands Lewis is on his way home, and he will discuss all these points fully with him. Message ends." Then on the 15th July your firm sent a letter to Whitehall saying: " With reference to your letter of the 7th July and our reply dated 10th July, we beg to suggest the following additional message for transmission by cable to the Government of Bombay." Then: " Buchanan has now satisfied himself that the dredger ' Jinga ' "—again that must be the " Kalu "?

Q.—" and the new dredger "—that is the " Sir George Lloyd "?

A.—Yes.

Q.—" Can work together on Bombay reclamation, and therefore work on construction of the wall can proceed from both ends simultaneously. Buchanan asks for very early orders as to whether he is to proceed on these lines, as considerable changes in designs for execution of work will be necessary." On the 29th July the Governor of Bombay telegraphs to the Secretary of State: " Work may start from both ends." That was communicated to you, and that is your warrant for saying in your report of 1922 on page 2: " Under the orders of the Government the construction of the new wall is being proceeded with from both ends simultaneously "?

A.—Yes.

Q.—That was an order of the Government?

A.—Yes.

(Adjourned for a short time.)

Chairman.—Before the adjournment we were on the question of the sea wall?

A.—Yes.

Q.—It amounted, did it not, to a proposal to do two independent dredging operations?

A.—Yes.

Q.—It would have involved four crews?

A.—Yes.

Q.—Two dredgers and two boosters?

A.—Two dredgers, yes.

Q.—And two boosters?

A.—I would not like to say about the two boosters at the present moment.

Q.—It was ultimately proposed to buy the " Jinga," was it not?

A.—I think the " Jinga " had been purchased then.

Q.—That is right; she was purchased?

A.—Yes.

Q.—She was supposed to work eventually in conjunction with the " Kalu "?

A.—The " Kalu " was purchased, yes.

Q.—The " Kalu " was purchased, and so also was the " Jinga "?

A.—The " Jinga " has been purchased since.

Q.—Yes. The " Jinga " was bought in order to work in conjunction with the " Kalu "?

A.—Yes, that is right.

Q.—She has never done any work yet?
A.—No, I do not think she has done any work yet.

Q.—She was bought for £10,000?
A.—Yes.

Q.—Have you any idea how many thousand pounds the repairs will be when eventually they are done?
A.—No, I have not.

Q.—She is still in dry dock being repaired, is she not?
A.—I have no information on the subject.

Q.—We thought she was a phantom ship for a long time, but eventually we found her in dry dock in India?
A.—I have never been consulted about the cost of repairs. I am in ignorance of the cost of anything.

Q.—In addition to all the plant there were two sets of floating pipe line?
A.—Yes.

Q.—One of the immediate results of deciding to build the sea wall from both ends was that you had to bring down 2,000 tons of spoil from the quarry each day instead of 1,000 tons, had you not?
A.—Yes, we had to bring down more, certainly.

Q.—2,000 tons?
A.—Yes.

Q.—Did that involve a purchase of some 130 wagons?
A.—Yes.

Q.—At a cost of about £375 each?
A.—Yes.

Q.—Half a million of money?
A.—Half a million of money. I am not going to say that if it was necessary to build the sea wall from both ends at once it was necessary to have double the plant and 2,000 tons of stone a day.

Q.—If the sea wall had to be carried on according to programme from the Marine Lines and it was supposed to involve, and it would involve 1,000 tons of stone a day, would it not?
A.—I would not bind myself to that.

Q.—Was not that the estimated figure to which they were working?
A.—They were working to that.

Q.—They were working to 1,000 tons a day. When you decided to have it built from both ends it had to be twice 1,000 tons, which is 2,000 tons?
A.—Yes, 2,000 tons.

Q.—It was rather an expensive decision, was it not?
A.—It was rather an expensive decision, but the atmosphere then was that money was no object.

Q.—You mean that the belief was that the land reclaimed, with which you had, of course, nothing to do, would be sold at such a great profit?
A.—At such an enormous profit.

Q.—It would be sold at such an enormous profit that two million pounds or three million pounds thrown away made no difference one way or the other; is that your point?
A.—Exactly, that the one million pounds would be spread over so many square yards of land. If you put one million pounds into so many million square yards of land in consequence of the enormous profits that were going to be made it really did not matter.

Q.—Buying a dredger at £75,000, spending £25,000 on her for repairs, and keeping her idle for five years, with the consequent loss of interest of £20,000 or £30,000, was really a matter of no importance?
A.—Not in the estimates of the revenue in those days.

Q.—So be it. Anyhow, do you suggest that building the sea wall from both ends was a business proposition?
A.—I wanted to do it from the top end.

Q.—I know that you did. The telegrams are quite clear, and nobody is suggesting that it was done on your initiative?
A.—No, it was not a business proposition.

Q.—That is what I wanted to know. It was not a business proposition?
A.—In that connection, to show how urgent the development at Colaba was considered, the Director of Development in a note addressed to the Chief Engineer, dated May, 1922, made the following remarks: " So far our energies have been directed

mainly to the Marine Lines end of the work, and at the commencement in the absence of information as to the proposed lay-out there was no particular reason for any special preference being given as between Marine Lines and Colaba. Mr. Davidge's preliminary lay-out plan has, however, now been accepted in the main, and it is evident, looking at the reclamation as a commercial proposition, that this portion of the reclamation from Colaba northwards as far as Mayo Road is of the first importance, a view which receives further support from the agreement we have come to to sell 265 acres at the southern extremity of the reclamation to the Military Department. It is in fact now apparent that in order to begin to realise money by sales to the Military and public as soon as possible we must concentrate on Colaba and reclaim from the South by sections, the sections being conveniently formed by bunds following the main roads running at right angles to the sea wall."

Q.—Apart from the agreement with the Military, there was another reason why Colaba should have been reclaimed first, was there not? The fact that the land at the Colaba end is far more valuable than the Marine Lines?

A.—Yes.

Q.—Therefore, as it was part of the scheme to get a return on the money as soon as they could, obviously it was better to begin at the Colaba end, and carry the reclamation along the part which would sell at a higher rate than the Marine Lines?

A.—Yes. From the engineering point of view it was very much cheaper to begin at the Marine Lines end, because to take one point, the railway from Marine Lines to Colaba cost, I think, 7 lakhs of rupees.

Q.—Your view was to have the " Kalu " pumping into what is marked on the map as Block No. 1; is that right? The " Kalu " was to pump at the Marine Lines?

A.—No. My view was that the " Sir George Lloyd " would pump into the Marine Lines, and the " Kalu," working close to the shore with a convenient pipe line, would pump into the small piece at the Colaba end.

Q.—Could the " Sir George Lloyd " ever pump into Block No. 1 at the Marine Lines end?

A.—That was always an open point, and we had it always under consideration, whether we should not have to put a land booster for the last piece.

Q.—I am very puzzled by an answer of that kind. In 1919 Bombay was just as it is there on the map?

A.—Yes.

Q.—There had been no increase of land anywhere?

A.—No.

Q.—If you now know in 1926 that you cannot do it, why did not you know that you could not do it in November, 1919; there has been no physical difference of any kind?

A.—I do not quite follow you.

Q.—You say it has always been an open point. You mean owing to the length of pipe line, do you not?

A.—Yes.

Q.—The length of pipe line to-day is the same as the length of pipe line was in 1919?

A.—Yes.

Q.—There is no difference. Why did not you ascertain that in 1919?

A.—We did not want to go to the expense of ordering a land station at that time. It is really a question of cost. You can pump through a very much longer pipe line than the maximum given, say 5,000 yards, or 10,000 yards. You can pump through a very much longer pipe line, but you do not get it at the full bore.

Q.—You get a reduced output?

A.—Yes. It was a matter for consideration whether for that small piece up at the top end you would do it with the longer pipe line—there was not much in that piece—or whether you would have an additional land booster.

Q.—There is also Block 2. Have you worked out the distances?

A.—We worked out all distances.

Q.—You have?

A.—Yes.

Q.—Then you are able to tell me, are you not, that to pump from the Harbour across that bit of the Peninsula into Blocks 1 and 2 could not possibly have been done with the plant estimated for in your Report?

A.—We did not think so at that time.

Q.—It is not a question of thinking. It is a question of arithmetic, is it not? The answer is that it cannot be done, is it not?

A.—I have a plan which I can produce.

Q.—Will you, on Monday, endeavour to show us how, with the plant available as mentioned in your Report, you could pump into Block No. 1 and Block No. 2?

A.—Yes, I will do that.*

Sir Harry Courthope-Munroe.—I did not quite follow, Sir, what was your inquiry. I want to see that Sir George Buchanan thoroughly understands it?

Witness.—You want me to produce on Monday a plan showing how, in 1919, we proposed to deal with the Marine Lines?

Chairman.—No, not a plan at all. I do not want a plan necessarily. Here is one of these little measuring instruments and you can do it on the map. You can measure it off on the map, and show us how it could be done.

A.—We worked it all out with models. I think we have got a plan.

Q.—If you have not got a plan, will you take it off the map, and show us how it can be done?

A.—Yes.

Q.—You will remember that you have got 10,000 feet of pipe line only to deal with in regard to this question?

A.—Yes.

Q.—The suggestion about building the wall at both ends came from non-technical people, the Governor of Bombay and his advisers?

A.—Yes.

Q.—Was not it your duty, as their technical adviser, to tell them that it was an expensive scheme; that it was not, as you have told me to-day, a business proposition?

A.—No, I do not think so. They gave their reasons why they wanted it started at both ends.

Q.—They have given the reasons, but you told me five minutes ago that it was not a business proposition, and I have given you a few figures about it?

A.—Yes.

Q.—The figures include £500,000 spent on extra rolling stock. Do not you think that you ought to have telegraphed back to the Governor of Bombay and said: "This will cost £500,000 in rolling stock alone. It will mean the employment of two dredgers, two boosters, and additional pipe line, and it will be a most costly undertaking"?

A.—I was asked if it were practicable, and I replied that is was practicable.

Q.—Practicable, of course, meant not merely possible from an engineering point of view, but practicable from a business point of view, did it not?

A.—There was no question of cost in those days.

Q.—You come back to the point that money was no object?

A.—I come back to the point that in those days money was no object.

Q.—It is being looked at very carefully to-day, is it not?

A.—Yes.

Mr. Billimoria.—Whose funds were these?

A.—Whose funds?

Q.—These were public funds, ratepayers' moneys. There was no consideration paid to ratepayers' money; is that what you suggest?

A.—I am not in a position to deal with the higher points of finance.

Chairman.—I think you put it in this way, that at that moment the authorities were of opinion that this would yield so much profit any way that a million or two really did not matter; that is it, is it not?

A.—Yes, that is it.

Mr. Billimoria.—If it was a business corporation would it have mattered to them? If it was not the Government, but a public corporation, or a private individual, would it not have affected their purse?

A.—I do not know. I think that even a public corporation, if they had such sanguine ideas as to the profits they were going to make might have said: "Carry on."

Chairman.—Continuing with page 42 of your statement, I am still reading the letter that you wrote to Mr. Montagu's private secretary. You say: "In this connection, a tender for the dredging plant, in accordance with the general specifications drawn up by my firm, was received from Messrs. Wm. Simons & Co., Ltd., and, acting on Sir George Lloyd's personal instructions, my firm took in tenders from other builders, the result of which was communicated to the Governor in Council, when I recommended Messrs. Simons' tender be accepted, subject to my firm's approval of the detailed plans and specifications, and to certain important modifications which appeared necessary to me after further consideration on the spot of the best means of carrying out the works?

A.—Yes.

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* See Appendix IX.

Q.—When you recommended the Government to accept Messrs. Simons' tender you had not seen the elaborate tender of Messrs. Lobnitz, had you?

A.—I could not tell you whether I had seen it.

Q.—Let me recall the dates to you. All that you had seen then was the telegram which your firm sent to you saying that Messrs. Lobnitz were offering two dredgers, and such and such material at such and such a price?

A.—Yes.

Q.—But you had not seen Messrs. Lobnitz's detailed specification of what they offered?

A.—No, I had not seen Messrs. Lobnitz's detailed specification.

Q.—Of course, you have the original of Messrs. Lobnitz's specification?

A.—I have that, yes.

Q.—You might look at it before Monday, because we have also a copy of it, and we should like to ask you some questions about it.

A.—Yes.

Q.—Your letter says: "—— and to certain important modifications which appeared necessary to me after further consideration on the spot of the best means of carrying out the works." What were the important modifications in the specification?

A.—Really, at this date I cannot recall them to memory.

Q.—I have looked rather carefully at the specification. Do you see any modifications after the 12th September? I cannot find any modifications.

Sir Frederick Hopkinson.—The only modifications have been modifications by which the work has been cheapened.

Chairman.—Yes You say: "—— and to certain important modifications which appeared necessary to me after further consideration on the spot of the best means of carrying out the works." "On the spot" meant after further consideration at Bombay, did it not?

A.—Presumably.

Q.—The contract was given to Messrs. Simons in May, 1920?

A.—In May, 1920, yes.

Q.—You left Bombay at some date early in 1920, did you not? You handed in a list of the dates when you were at Bombay? *

Sir Harry Courthope-Munroe.—The earliest date mentioned there is the 15th of November, at the top of the page.

Chairman.—It is a pity that we have not got the 1919 dates, but we can put them in?

A.—I can get them.

Q.—What I suggest to you really is that you recommended Messrs. Simons' tender to be accepted some time in 1920, or very early in 1921?

A.—Yes.

Q.—That must be so, I think. You cannot tell us what were the important modifications which you made in the specification?

A.—No, I cannot at this date recall them.

Q.—So be it. In paragraph 55 of your statement you say: "I received a letter from Mr. Brown, the private secretary to the Secretary of State, on the 23rd of March, 1920, saying that the Secretary of State was at present away from the office on account of ill-health, but that Sir John Steevens, Acting Director-General of Stores at the India Office, would be pleased to see me and discuss the Back Bay Reclamation Scheme; that he had been anxious to have an opportunity of going through the matter with me on my arrival from India, and would be glad to make an appointment with me if I would suggest a time. Accordingly I met Sir John Steevens on the 25th March, 1920?"

A.—Yes.

Q.—Then you say that on the same day you wrote to Sir George Lloyd?

A.—Yes.

Q.—At page 44 of your Statement you say: "In the first place I may say that the India Office asked Messrs. Simons & Co. to extend the time of their tender for the dredger, and they agreed to do so provided there is another material increase in their prices, and I was not far out when I told you that if the order was not placed before the 12th March it would cost your Government another £100,000."

A.—Yes.

Q.—Was that the 12th March, 1920?

A.—The 12th March, 1920, it must be.

* See Appendix X.

Q.—" After discussing the dredger proposition generally Sir John Steevens informed me that the India Office had passed orders to the effect that no order for the dredger was to be placed until the whole scheme had been sanctioned, but that he, along with his experts, was to go into the question of the dredger and decide if Messrs. Simons & Co.'s offer was desirable both from the practical and financial points of view." Was the tender of Messrs. Lobnitz ever submitted to Sir John Steevens?

A.—Not to my knowledge.

Q.—Or to Sir John Biles?

A.—Not to my knowledge.

Q.—You know as a fact that it was not?

A.—I do know that it was not; it was not submitted by my office, at all events.

Q.—" I also explained to Sir John Steevens that as we have been appointed the Engineers to the Back Bay scheme we wished to get on with the working drawings of the wall and generally proceed with the arrangements for carrying out the work as soon as possible; he made a note of this and promised to let me know when anything was settled." This is to Lord Lloyd?

A.—Yes.

Q.—" Meanwhile, time is passing and I am afraid you will be very disappointed at the continued delay in getting the Secretary of State's sanction to the entire scheme, and at this rate it will be almost impossible to have the dredger ready for work by the end of the 1921 Monsoon."

A.—Yes.

Q.—That meant October, 1921?

A.—October, 1921.

Q.—It was a real blessing that she was not ready; was it not?

A.—As it happens it was a blessing.

Q.—It was a real blessing?

A.—But you must remember that Lord Lloyd had been pressing to begin the work in October, 1920.

Q.—Yes, you have explained that. The dredger arrived in March, 1922?

A.—Yes.

Q.—" The Colaba," the booster, arrived a little later in April?

A.—Yes.

Q.—The pipe line was delivered round about the same time?

A.—Yes.

Q.—The total was about £650,000?

A.—Something like that, yes.

Q.—The " Sir George Lloyd " remained idle, so did the " Colaba " and so did the pipe line for 21 months, did they not?

A.—For 21 months I think, yes.

Q.—There not being for 21 months any single one of those little lagoons ready to receive reclaimed material?

A.—That is so.

Q.—Did that circumstances alone involve a loss taken at 6 per cent: of some £68,000?

A.—I suppose it did, yes.

Q.—And also depreciation as well?

A.—Yes.

Q.—The " Colaba," the " Sir George Lloyd," and especially the pipe lines, had to go through two monsoons doing nothing?

A.—Yes.

Q.—Does the absence of a lagoon for the dredger to do her work in appear to you to to be a lack of co-ordination?

A.—The absence of the lagoon to do the work?

Q.—Does the absence of any lagoon for the dredger to pump material into for 21 months seem to you to be a lack of co-ordination?

A.—It seems to me a lack of organisation and co-ordination, yes.

Q.—So be it. Do you attribute it mainly to the fact that the building of the sea wall was postponed until October 1921.

A.—I attribute it partly to that, and I attribute it to the delay in proceeding expeditiously with the wall at Colaba. In our judgment the dredging should have started in December 1922. In our judgment there was no reason why the dredging should not have started in December 1922 or January 1923. If the work had been pushed with more energy the dredging would have begun in December 1922.

Q.—Did not you at one time expect the first section of the wall to be ready by October 1921?

A.—That was an old arrangement which was cancelled by the Governor in Council. That was on the supposition that a contract was going to be let to a construction company in Bombay to begin the work. The whole year was lost by the work not being begun as Lord Lloyd wished in October 1920.

Q.—That still would not have accounted for it, would it, because no pumping began until the 8th December 1923?

A.—Yes, but in our judgment there was no reason at all why the pumping should not have begun in 1922.

Q.—For six months at all events, prior to October 1922, you would have been in England, I suppose?

A.—Yes.

Q.—Can you point to any letters in which you are censuring them or criticising them for not being ready to do the pumping in 1922? *

A.—Yes, I certainly can. I think I can give you one almost at once. Will you kindly turn to page 88 of my Statement. It is with reference to the Chief Engineer's breakdown in health. In paragraph 114 I say : " That Sir Lawless Hepper was aware of the way in which work was suffering is clear from the correspondence. For instance, in a letter dated 12th May, 1922, he said, ' After endless delays the railway to Colaba has been begun and I hope that under a different regime it may be possible to get it finished by October,' and on the 8th of June, 1922, I replied :—' I am very disappointed to hear from you that the railway to Colaba is just begun because so far as I am aware there was nothing to prevent it being by this time very nearly finished.' " That is just one example of the delays that occurred, and I was always urging that this railway to Colaba should be pushed on with in order that the wall should be pressed ahead at the Colaba end.

Q.—Are there any other letters?

A.—I have other letters which I will look up.

Q.—Yes. When did you consider that Mr. Lewis had become thoroughly unsatisfactory.

Sir Harry Courthope-Munroe.—That is dealt with at the bottom of page 87 of the Statement.

A.—In paragraph 104 I say : " Some time in 1921 the health of Mr. Lewis showed signs of giving way." I have dealt with that in paragraph 104.

Chairman.—Yes, you have. I will deal with that in detail later. All I want to know for the moment is, about what date did you become thoroughly dissatisfied with Mr. Lewis?

A.—It is very difficult to give an exact answer to that question because I might say that the dissatisfaction was progressive from 1921, when Mr. Lewis's health showed signs of giving way. He was laid up for three weeks in June, 1921. We got progressively anxious from that date, and on the 11th April, 1922 (page 83 of my Statement) I wrote to Sir Lawless Hepper and said : " I wonder if you are taking any action on the lines I suggested to His Excellency and to yourself."

Q.—" I wonder if you are taking any action on the lines I suggested to His Excellency and to yourself "?

A.—Yes.

Q.—Was that to get rid of Mr. Lewis?

A.—Well, it was.

Q.—Why not?

A.—Yes.

Q.—If the man could not do his work, whether from ill-health or anything else, the man ought to go?

A.—Yes, that was the suggestion that I made. It is not in writing. It was a suggestion that I made on the 11th April, 1922.†

Q.—That he should go?

A.—Yes.

Q.—That is all right. Have you seen Mr. Lewis during the last two or three weeks?

A.—I have not seen him for some years.

Q.—I was wondering if you had seen him because Mr. Lewis came and gave evidence before us, and his health must be very, very bad. Was he, even in 1919, a man of drive and energy?

A.—He was. I would like to make it quite plain that I do not want to make any reflections on Mr. Lewis's ability. I consider that Mr. Lewis is a very capable, brainy engineer, full of energy, and he was full of energy when he was engaged by us at the

* See Appendix XI. † See Appendix XXI.

beginning of the work, but he was subject to gout, and as time went on his whole physical and mental nature changed.

Q.—In 1921 you noticed a considerable change in him, did you?

A.—In 1921 I noticed a considerable change, and I never saw Sir Lawless Hepper without discussing the matter with him. Naturally I was very anxious and, as I say, on the 11th April, 1922, I said that I wondered if he was taking any action on the lines I suggested.

Q.—That is right?

A.—We said : " We feel very strongly that in the interests of the work there should be no chance of the repetition of this disastrous year of sickness."

Q.—I think on the 20th April, 1920, you had an interview with Mr. Montagu?

A.—Yes, that is correct.

Q.—And you presented a Memorandum stating the position of the Back Bay up to date?

A.—Yes. I said that Sir George Lloyd was particularly insistent——

Q.—I think this is important enough to read in its entirety. It is on page 46. You presented a Memorandum of which the following are extracts :—

" The position when I left Bombay was as follows :—

" The scheme as prepared by myself had received the approval of both the Government of Bombay and the Government of India, and the Governor (Sir George Lloyd) had discussed with me the best methods of executing the work, and had also explained his proposed organisation for carrying out not only the Back Bay Reclamation Scheme, but the whole of the housing and improvement schemes. I was informed that a despatch had been issued by the Government of India to the Secretary of State asking sanction to the entire project, and that it was tolerably certain sanction would have been received by the time I got to London.

" Sir George Lloyd was particularly insistent that the Back Bay Reclamation work must be started at the end of the monsoon, say about the month of October, 1920, and I left with the Governor a note explaining how this was to be done. I also recommended the appointment of a resident engineer, and time being an object I proposed that a contract for the first section of the wall should be given to Colonel Grisewood's Syndicate, who were in a position to make a start with the preliminaries, and begin the permanent work directly after the monsoon.

" My instructions were to proceed home with all possible speed, and, on the assumption that the Secretary of State would have sanctioned the scheme by the time I got home, I was—

" (*a*) To make arrangements for the construction of the dredger, and

(*b*) To put in hand the necessary drawings and estimates for the construction of the wall

and I was given a letter to the Private Secretary to the Secretary of State saying that his Excellency was anxious that I should be given an opportunity of discussing any details of the scheme which appeared to require explanation, with the Secretary of State."

Q.—Then I will turn to page 48. This is still the narration, is it not?

A.—Yes.

Q.—" On the 16th April I had a meeting at the India Office with Sir John Steevens and Sir John Biles, and came to a satisfactory understanding as to the relative responsibilitiy of Sir John Biles and myself. I then informed Sir John Steevens of the letter I had received stating that a firm of contractors had been given the contract for the first section of the wall, and I remarked that the most vital matter in connection with the whole scheme was to place the order for the dredger, as if this was not done promptly a whole year's time would be lost, all our plans being made on the assumption that the dredger (which would take a year to build) would arrive in Bombay in time to start operations at the end of the 1921 monsoon." By " in time to start operations " you mean to find a lagoon ready constructed?

A.—Yes.

Q.—Then you say at page 49 : " It is perhaps a pity that the Back Bay scheme is involved with so many other projects because, taken by itself, it must be exceedingly profitable to the Government."

A.—Yes, that was the current opinion.

Q.—When the matter was put before the Legislative Council on 3rd August, are you aware of there being any dissentient to the scheme?

A.—I do not know. I have no knowledge of that.

Q.—We have the debates here. Then " The following is an extract from the memorandum of my interview written on the 21st April." This is a record of your interview with Mr. Montagu, is it?

A.—Yes. I wrote it the day after I had seen him.

Q.—You handed him the memorandum from which I have read extracts?

A.—I did, yes.

Q.—And he wrote upon it " Sir George has given me a characteristically strongly worded memo. which was for my private information and to which under the circumstances I take no exception. Sir George Buchanan explained that the project was being held up on account of the order not being placed for the dredger and I direct that the papers be circulated and the case be brought up in Council for final decision on Tuesday next."?

A.—That was my recollection.

Q.—Your recollection 24 hours after the interview?

A.—Less than that.

Q.—" Mr. Montagu then talked to me rather freely. He said that he had discussed the Back Bay scheme with Sir George Lloyd, who was sitting in the Chair I was then occupying." You mean " who had been sitting in the chair you were then occupying "?

A.—Yes.

Q.—" Who had been sitting in the chair I was then occupying, and he had impressed upon him the necessity of the work and the importance of its being done by Government.

Mr. Montagu said he was whole-heartedly in favour of the project, which had always been most attractive to him.

I then explained to him my position, viz., that after my scheme had been approved, Sir George Lloyd had asked me whether my firm would be the Engineers as he did not wish the Bombay Public Works Department to have anything to do with the work. I had agreed on behalf of my firm and had promised to make the carrying out of the work my principal object, if necessary declining works elsewhere, and I had agreed to go out and spend several months every winter in Bombay."

Then you discuss the matter of the Grisewood contract, and I think on the 5th May you learned that approval had been given to proceed with the purchase of the dredger?

A.—Yes.

Q.—We know that on the same day that approval was given for the purchase of the dredger, administrative sanction was also given for the scheme itself?

A.—Yes.

Q.—Then you continue : " On the 14th June, 1920, I had a meeting with Sir John Biles and Mr. West from the India Office, and discussed with them the Back Bay dredger and plant. Together we went over the tender and specification for the dredger, discussed the question of the supply of electric current for the relay station, the manner in which the dredger was to be delivered at Bombay and the erection of the pontoons and pipe line at Bombay."

Then you say, " In concluding this summary of the history of the scheme from its inception I wish to record the opinion that there was no undue haste shewn by anyone in proceeding with the work. For many years the project had been discussed and re-discussed and pending its disposal one way or the other it was blocking the development of Bombay. Once the scheme was sanctioned obviously the correct procedure was to get to work as soon as possible and Sir George Lloyd's (now Lord Lloyd) anxiety to see a beginning made at the end of the 1920 monsoon instead of losing another whole year was reasonable. Although not being an engineer he did not realise the amount of preliminary work necessary in all large schemes before operations can actually be begun. Had the work been entrusted to the Bombay Public Works Department it would, I judge, have taken at least three years before anything was done, not on account of the unwillingness or inability of the Engineers belonging to the department, but in order strictly to conform to procedure."

Then you say how they acquired the town planner's lay-out and a complete working project estimate, and you continue, " Our plan of operations was to prepare a general scheme and estimate and the detailed plans and estimates step by step as the work proceeded, a by no means unusual procedure. I said, and it has been proved correct, that the way prices of labour and materials were fluctuating in 1920 made the preparation of a complete project estimate a useless waste of time, unless indeed prices were included which could hardly under any circumstances be exceeded." Prices were fluctuating, were they, in 1920, very much?

A.—Yes.

Q.—And in 1919?

A.—No. The great fluctuation did not begin in 1919.

Q.—Had there been, between 1912 and 1919, a rise in materials, plant and labour, taken collectively, of at least two-and-three-quarter times?

A.—No. I should say that machinery, and so on, rose about two-and-a-half times.

Q.—We have had rather elaborate figures given us in evidence about it from the Director of Stores. I should like you to come up to my figure of two-and-three-quarter times—that, taken collectively, between 1912 and 1919 the price of steel plates, coal, fuel, wages, rolling stock, cement, and all those things had gone up, taken together, two-and-three quarter times over that of 1912?

A.—No, I should not say that.

Q.—Well, two-and-a-half times?

A.—I say two-and-a-half times, generally speaking.

Q.—Two-and-a-half will do for the moment.

A.—Naturally I went into the question.

Q.—In 1919-20 were prices higher than in 1919?

A.—About 1920 undoubtedly prices began to soar.

Q.—In 1919 you were able to give an estimate correct to two points of decimals, were you not—367·61?

A.—Yes.

Q.—If you could do that in 1919, why could not a contractor have given an equally close estimate in 1920?

A.—No, I do not agree.

Q.—Have you taken out a schedule of figures from 1912 to 1922 just to see what was happening all the way through?

A.—I have some general figures.

Q.—There is no difficulty about getting a list of that character, is there?

A.—I suppose not.

Q.—Because we shall have to examine, you know, the rise in prices between 1912 and 1919, to understand if Mr. Kidd's estimate of 325 lakhs was a correct figure, how in 1919 you could do the work for 367. We will have to look into that?

A.—Yes, I shall be delighted to.

Q.—Then we ought also to consider whether there was such a rise in material between 1919 to 1921 as to justify the price of 702 lakhs as the revised estimate?

A.—Yes.

Chairman.—Take your own figure of 668; that will do just as well—in 1921. We might just discuss that a little on Monday.

Sir H. Courthorpe Munroe.—The witness can deal with it now, Sir. He has his notes before him which he can go into, if you care to.

Witness.—I would rather do it on Monday, I think.

Chairman.—I feel I am a little behindhand on this report, and I would rather pass through a few more pages. Now I come to page 53, to your agreement. We have all read what you have said with regard to that. The agreement may have very little practical bearing on the matters we have to decide, and on one important matter it has no bearing at all; but you emphasize, quite rightly, that your position under that agreement was that of engineers and that you were not in the position of contractors. That is the first broad matter, is it not?

A.—Yes.

Q.—After the recitals it begins: "Now it is hereby agreed, the Firm agree to act as engineers to the Secretary of State in carrying out the said scheme and in the construction and execution of all works connected therewith until the final completion thereof; shall at all times assist and advise the Government of Bombay in all matters relating to the execution of the works, and shall supervise the same and undertake and perform all work and duties devolving upon engineers of large works."

A.—Yes.

Q.—"And in particular the following duties." Then it gives a schedule of duties in England and duties in India?

A.—Yes.

Q.—Then there is this very curious passage in the second paragraph of Clause 2: "The resident engineer will be nominated by the firm and will carry out the details of the work in accordance with the firm's instructions." Do you understand what that means?

A.—In the light of events, I must say that I do not understand it.

Q.—Suppose that clause stood by itself, would not it imply that you were to appoint a resident engineer, that you were to tell him what were the details of the work to be done, and that he was to carry out those details in accordance with your instructions?
A.—Yes, if it stood by itself.

Q.—I do not understand it. I do not know whether you can help me about it. It does not seem to me to be *in pari materia* with the rest of the agreement?
A.—No.

Q.—At all events you are emphasising that your position was that of an engineer and not that of contractor?
A.—Yes.

Q.—So be it.
A.—Then, as you are aware, Mr. Chairman, there was an amended agreement later on.

Q.—Yes. I will come to that in a few moments. On the 4th January, 1923, Sir Chimanlal Setalvad had raised the question as to how it happened that the Development Directorate were employing surveyors and draughtsmen, did he not?
A.—Yes.

Q.—And you had a meeting to discuss the responsibility which you were under with regard to the preparation of plans, estimates and so on?
A.—For temporary works.

Q.—You took the point that you could not be called upon to do temporary work for the reason that you were established in England and the work was going on in India, and that you were responsible for the general plans and specifications relating to permanent work?
A.—Yes.

Q.—On page 61 there is the record of what had been arrived at: " After discussion the Hon. Member agreed to the following recommendations which it was understood Sir George Buchanan was prepared to accept "?
A.—Yes.

Q.—(b) is the one. " Messrs. Meik & Buchanan are the engineers for the reclamation and connected works only, and not for roads, drains, lighting and other things necessary for the development of the reclaimed area, but the cost of so much of the storm water drainage system as has to be constructed during the progress of the reclamation is to be included in the amount on which the percentage for the purposes of the firm's remuneration is calculated." Then " The obligation which Clause 1 (*a*) of the agreement lays on the engineers to carry out certain work in London may, with a view to securing a workable arrangement, be held to be confined to the permanent works only of the reclamation, including storm water drains referred to in (*b*). And in order to ensure better co-ordination, all correspondence between the engineers and the chief engineer, Reclamation Branch, should in future be addressed through the Director of Development, a copy of each document being forwarded at the same time for record in the Director's Office." I see there a reference to storm water drains. They were a very important item, were they not?
A.—Are we coming to storm water drains now? They were an important item, yes.

Q.—Yes, I will come to them. Page 29 of your report gives certain figures, " Roads, drains, lighting as per Government Public Works Department estimates, lump sum, 75 lakhs "?
A.—Yes.

Q.—Have you got that estimate here?
A.—I have never seen it.

Q.—Then where did you get the figures?
A.—It was for roads, lights and storm water drains.

Q.—How did you get the figure? Who gave it to you?
A.—I took Mr. Kidd's figure of 50 lakhs.

Q.—I see; now I understand. If you turn to page 13 you will find Mr. Kidd's item No. 5: " Roads, lighting and drains, Public Works Department, 59.45 lakhs "?
A.—Yes.

Q.—Then all you did was to take that statement and add to it 15·55 lakhs?
A.—That was so, yes.

Q.—What was in that you have no idea?
A.—I have no idea at all.

Q.—We have got the documents, and if you would care to have them I think one can assert with safety that there were no storm water drains in them?
A.—I can assure you that I never saw any document.

Q.—So be it.

A.—As there were no other drains, naturally I took it as storm water drains.

Q.—But the storm water drains themselves cost 64 lakhs, did they not—nine storm water drains, 64 lakhs?

A.—The Development Directorate have spent 64 lakhs, yes.

Q.—That would only leave 11 lakhs for the roads and lights and other drains, which would be a wholly insufficient amount, would it not?

A.—A wholly insufficient amount. There was never any intention to include other drains or to include the layout.

Q.—But how do you know, Sir George? If you had never seen the estimate, how do you know what was included in roads, lighting and drains? You say you have never seen it?

A.—No. I always understood that the sewerage was going to be done by the Municipality. It was nothing to do with us at all. We were not dealing with anything except the reclamation. Therefore in my estimate I dealt with one or two main roads and the storm water drains—well, I took Mr. Kidd's estimate.

Q.—You took that; very well.

A.—But storm water drains had never been forgotten. We had never forgotten storm water drains.

Q.—What did you say?

A.—We never, as is suggested, forgot that there would have to be storm water drains. It was not possible at that time to come to any details about storm water drains.

Q.—We must look into this. Did the Development Directorate people, Mr. Lewis or Mr. O'Rorke, write you a letter saying in terms that the storm water drains had been overlooked?

A.—I do not remember what they wrote on the subject.

Q.—The witnesses have been called and they have all asserted in Bombay with the utmost distinctness that the storm water drains were overlooked. That is the way in which they put it, and they point to one or two letters, and they also point to the fact that the storm water drains come to £482,000?

A.—Yes, which is less than 75 lakhs.

Q.—But leaves, as you have said a minute ago, a wholly insufficient provision for roads and lighting and drains. Would it be right, do you think, to attribute to the 75 lakhs about 55 lakhs for roads?

A.—I would not like to say what estimate is attributable to roads, but on the 14th February, 1921, I wrote to Sir Lawless Hepper " A work which is not urgent but must be arranged for is the prolonging of the storm water drains ".

Q.—Where is that letter?

A.—It is a letter dated 14th February, 1921—" A work which is not urgent but must be arranged for is the prolonging of the storm water drains from the present sea front to outside the new wall ".

Q.—Our correspondence begins on the 14th April, 1921.

A.—I daresay I can get you that; I will find out.

Q.—Did you have any answer from Sir Lawless Hepper?

A.—I do not think so. I said " A work which is not urgent but must be arranged for ".

Q.—Is that a letter to him?

A.—It is a letter to him dated 14th February, 1921.

Q.—Have you got a copy of it?

A.—I have only got a cutting. Here it is (*Handing same to Chairman*).*

Q.—I think, Sir George, we must cable to Sir Lawless Hepper about this letter. Could you let Mr. Ewbank have a copy of the complete letter?

A.—I will look up my files and get the complete letter if I can.

Q.—The object of a storm water drain was to carry off, as the word implies, storm water?

A.—Yes.

Q.—Before there was any shutting in of the Bay there were old existing storm water drains?

A.—Yes.

Q.—What had to be done was to prolong them and carry them out to sea until they discharged on the seaward side of the sea wall?

A.—That is right, yes.

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* See Appendix XI.

Q.—Therefore had not they to be constructed practically at the same time as the sea wall?

A.—Not necessarily.

Q.—You could not begin any pumping until you had your storm water drains in, could you?

A.—No.

Q.—So that the sea wall, cross bunds and storm water drains were all essential before any reclamation could begin?

A.—Not the storm water drains, because in certain cases, I remember (it is on the records) I proposed a method of pumping into an area before the storm water drain was made.

Q.—Did you propose to block up any of the existing storm water drains?

A.—Naturally you could not block up a storm water drain.

Q.—I do not quite follow, because, you see, if you enclosed any area in which there was a storm water drain you would have to prolong that storm water drain before you had any reclamation, would you not?

A.—You could reclaim an area where there was not a storm water drain, or you could divert a storm water drain.

Q.—There is a storm water drain in the military area, Block 8, is there not?

A.—Yes.

Q.—And a storm water drain in Block 1?

A.—Yes.

Q.—And Block 2?

A.—Yes.

Q.—Obviously you are going to begin either at one end or the other?

A.—Yes.

Q.—In either case you have a storm water drain?

A.—Yes. There are methods of diverting storm water outside a particular area.

Q.—But surely instead of diverting a storm water drain the logical thing was to prolong the storm water drain through the sea wall, was it not?

A.—That is what was done.

Q.—But there has never been any suggestion in any of the correspondence that you should temporarily divert a storm water drain, has there?

A.—No, but I should like to refer to Paragraph 123 of my statement.

Q.—Certainly. Will you do so?

A.—" It should be borne in mind that it was not possible to design the drains, cross bunds or locate main roads until more was known about the lay-out of the reclaimed area and the preliminary scheme of Mr. Davidge, the expert town planner was not received by me until March, 1922. After the lay-out had been received and approved by the Development Directorate we wrote to the Chief Engineer and asked for certain sections and levels in order that we could take up the question of the storm water drains and on the 14th September, 1922, the Acting Chief Engineer wrote that he hoped to send us the plans and sections of the storm water drainage area in about a fortnight's time, but in a subsequent letter said that he had been instructed by the Director of Development not to send the plans, as the work was not within the scope of our duties. This seemed to us rather extraordinary as on the 4th July, 1922, Sir Lawless Hepper had written to me as follows: ' Questions of storm water drainage, sewage, lighting and roads in the reclaimed area itself are likely to be more important and to involve much more expenditure than was anticipated, and the proposals and plans connected with these services will be submitted to you '." Meanwhile the Chief Engineer took in hand the designs on his own account. On the 5th January, 1923, I wrote to Sir Lawless Hepper and referred him to the previous correspondence, and said we would like to go into the matter of the storm water drains. " On the 8th January, 1923, the Chief Engineer wrote : ' An inspection of Mr. Davidge's plan indicates the position of the storm water drains for the area of the reclamation. The drains have obviously to discharge under the sea wall and will naturally be placed on the axes of the main avenues running east and west across the area.' And on the 26th January, 1923, he wrote saying that he had prepared a design of the drains after having been told by Sir Lawless Hepper that they would not be included in the work carried out by our firm."

Q.—On the 11th August, 1922, did Mr. O'Rorke write to you : " In the office here I am getting on with the storm water drains lay-out so as to be able to fix the levels of the various outfalls which will have to be made through the wall, and will be sending plans for your approval shortly."?

A.—Yes. That was after the expert town planner had made his lay-out.

Q.—I am suggesting to you that all that it was necessary to do was to carry forward the existing storm water drains through your sea wall, and that the plans for the storm water drains ought to have come out with the plans for the sea wall and the cross bunds, unless they were overlooked. What do you say, Sir George?

A.—I disagree, Mr. Chairman. I have not got a plan of the storm water drains handy, but it was not practicable. It was quite impracticable to take every one of those drains and put it through the wall.

Q.—Mr. O'Rorke, who was then acting chief engineer—Mr. Lewis having fallen ill—writes on the 25th August, 1922: "I am getting out the Budget for next year, and will send you a copy when it is ready. In this connection one very important point appears to have been overlooked"—that is, in the Budget?

A.—Yes.

Q.—"That is, that all the main storm water drains will have to be built simultaneously with the cross walls, because provision has to be made for existing storm water drains discharging into Back Bay before the dredging reclamation commences. Otherwise, these drains will be choked up. I am accordingly allowing for the construction of two southern storm water drains in 1923-24, one through the middle of the military area, which besides draining these, collects two existing storm water drains in the neighbourhood of Roberts Road, and the other one along the district north of the military area." Is not that the clearest indication possible that in Mr. O'Rorke's mind there had been no provision in any estimate, or in any Budget whatsoever for storm water drains?

A.—What date was that?

Q.—The 25th August, 1922.

A.—Surely that was when the detailed project estimate was under consideration? He refers to the Budget.

Q.—The Budget for 1923-24.

A.—He refers to the Budget, but he does not refer to the estimate.

Q.—That is right. The suggestion is that financial provision was not made by Mr. Kidd, was not made by you, or was not made by anybody, until the estimate of 668 lakhs by yourself in February, 1922, and by Mr. Lewis's letter in that year, in his 702 estimate. If you look up your report you will see there is a revised estimate—the report of 1922?

A.—Yes.

Chairman.—It is at about page 13 in that report.

Q.—Have you noticed at page 14 Mr. Kidd says: "Roads, lights, drains, 58 lakhs" in 1912, and yours in 1919, 75 lakhs, following Mr. Kidd without any knowledge of the details on which Mr. Kidd worked?

A.—Yes.

Q.—Then on the 11th February, 1922, you put: "Roads, lights, storm water drains and sewerage, 135 lakhs."

A.—Yes.

Q.—That, you notice, is an increase of 63 lakhs over your 75 lakhs?

A.—Yes.

Q.—And the storm water drains in fact came to 62 lakhs?

A.—Yes.

Q.—Is not that some indication that in your report of 1919 you have, as Mr. O'Rorke says, omitted the storm water drains?

A.—No; I will not admit that. At all events, you have this letter, which I will produce, in 1921 in which I talk about storm water drains.

Q.—When you got Mr. O'Rorke's letter of the 25th August, if that was true it was a very serious reflection upon you, was not it?

A.—He said it was not in the budget.

Q.—"In this connection one very important point seems to have been overlooked, that no provision has been made by anybody for storm water drains." That is the essence of the thing?

A.—Does not he say in the budget?

Q.—"All the main storm water drains will have to be dealt with simultaneously because provision has to be made for the existing storm water drains before reclaiming," and so on. "I am accordingly allowing for them." Put in that way I see what you mean; but what he says is this: "It has been entirely overlooked. Nobody up till now has ever considered the necessity for storm water drains, and therefore nobody up till now has estimated any amount for them." The evidence that was given was that Mr. Lewis did discuss with you in the very early part of 1922 the question of storm water drains, and that it was, apparently, admitted that they had been overlooked, and that you revised your estimate from 75 lakhs to 135 lakhs, subsequently adding the words: "storm water drains" to "roads, lights and sewerage." That is how it is put.

A.—That is how it is put, yes.

Q.—I want you to see the point.

A.—I see the point.

Q.—In Mr. Kidd's estimate for " roads, lights and drains " there is 59 lakhs. In Sir George Buchanan's estimate " roads, lights and drains " there is 75 lakhs. In 1922 Mr. Lewis said: " We called Sir George Buchanan's attention to this. He in his revised estimate put ' roads, lights, storm water drains and sewerage ' ", and it was not until your attention was called to it that you realised that that would have to be a very considerable item of expenditure. That is how it is put.

A.—That is how it was put, but if I may say so, it has not been put correctly.

Q.—When you got this letter from Mr. O'Rorke on the 25th August—you would get it in the middle of September, 1922—saying that one very important point, namely, the storm water drains, appear to have been overlooked——

A.—Overlooked in the budget, I think he said.

Q.—No; I will get it clearer for you if you want it: " In this connection one very important point seems to have been overlooked: that is that all the main storm water drains will have to be built simultaneously with the cross walls." That is what had been overlooked.

A.—That is when he is discussing the budget, I think?

Q.—Yes.

A.—Overlooked in the budget.

Chairman.—No; that is not it. I will give you the evidence in detail.

Mr. Billimoria.—The plans for the storm water drains were not prepared till 1922 or 1923. There are letters written by Mr. Lewis on that subject. In your letter of the 18th April, 1923, you examine the plans for the first time.

Chairman.—It is page 104, dated the 10th December, 1923, in the large bundle of correspondence. Mr. Lewis says: " I notice that Messrs. Meik & Buchanan in their letter make no mention of storm water drains. As they are an exceedingly important item of the work the omission detracts from the value of the proposal." You put forward a certain alternative proposal, and Mr. Lewis makes that comment. When Mr. O'Rorke had stated that the item appeared to have been overlooked, namely, the storm water drains, which was an important point, did you challenge that in any correspondence?

A.—I do not know whether we challenged it in any correspondence, but if we wrote to Sir Lawless Happer in 1921 and reminded him that the storm water drains were a matter for consideration it shows that at all events we had the storm water drains in our minds.

Q.—It does, undoubtedly. That is a matter we will have to ask Sir Lawless Hepper about.

A.—It would be impossible to overlook the storm water drains, because I used to walk there every day and see the water coming out. I have also got a letter to the Director of Development, in which I pointed out that no allowance had been made for sewering the reclaimed area, because it was to be done by the municipality. I still adhere to-day to the statement that the storm water drains were not overlooked. We are rather out of the order of things now, but I made a revised estimate in 1922.

Q.—On the 11th February?

A.—Amounting to 686 lakhs.

Q.—That is right.

A.—Sir Lawless Hepper in his evidence said that I had asked for the estimate back, and added 100 lakhs to it.

Q.—Sir Lawless Hepper put it that your estimate was 568 lakhs?

A.—Yes.

Q.—He thought that you added 100 lakhs to it as a lump sum, and looked at the estimate, and then came to the conclusion that you had spread it over the whole lot. It is obvious that you could not have added 100 lakhs. The point about that estimate, and the only point I am on for the moment now, is this. That is the first time, as far as we know, and as far as we have known up to now, that you had ever mentioned the storm water drains in writing. You gave no plan of them appended to your report.

A.—No; it was impossible to make a plan of them. It would be very interesting if you were to have a plan showing all the outlets that the storm water was coming from, and how they have been collected and put into the storm water drains. You would not find that every outlet has a storm water drain. They were collected together and put into a certain number of storm water drains, the situation of which could not be settled until we had the town planners' lay-out.

Q.—Did you communicate with the town planner and ask him to send you the lay-out?

A.—Well, we got the lay-out as soon as he had got it finished. As to my estimate of the 11th February, 1922, here is the one which I took in to Sir Lawless Hepper, and which at his instigation I altered. (*Document produced.*)

Q.—That is the one that has the words, " storm water drains "?

A.—Yes.

Q.—That is the point that has been made against you so much in Bombay, that the 11th February, 1922, was the first time that you had ever put on paper a single syllable about storm water drains; and that when the matter was mentioned in 1921 you were making no bones about it at all that it had been overlooked by you. That is how it is put?

A.—That is how it has been put.

Sir H. Courthope-Munroe.—May I respectfully call your attention to the terms of the estimate on page 29? The figure of 75 lakhs is given, but against it is the note: " As per Government Public Works Department estimate." Therefore, in strict legal phraseology that is not his estimate at all; but he puts in a figure. He does not purport to estimate anything. He says: " As per Government Public Works Department estimate." I only want to draw your attention to that.

Chairman.—Did you notice the history that Sir George has given of it? He says: " I never had any Public Works Department estimate at all." He has just said so. He said: " I never saw any document."

Sir H. Courthope-Munroe.—Quite so; but what struck me was that speaking of the estimate which he gives of 135 lakhs as being the revised estimate, it would appear to be the first time that he really in fact estimated anything.

Chairman.—It may be so.

Sir H. Courthope-Munroe.—That is the only point I want to make.

A.—In 1921 there is a letter on record showing that I had not overlooked the storm water drains. There is a letter to Sir Lawless Hepper in which I said: " The matter of the storm water drains must not be overlooked." On the 11th February, 1922, here is my estimate: " Roads, lights and drains."

Q.—Surely not. Just read it again?

A.—Yes. " Roads, lights and drains, 75 lakhs." Acting under Sir Lawless Hepper's instructions really I put on sewerage in order to differentiate on making the plans that " drains " meant storm water drains; here is the writing exactly as I did it on the 11th February, 1922: " Roads, lights, storm water drains with sewerage." I have altered " drains " to " storm water drains " to differentiate it from sewerage; but " drains " was always meant to be storm water drains.

Q.—That is how it has been put in Bombay. What they say is, as a result of conversations you agreed that you had omitted storm water drains, and you specifically include them in your revised estimate, and add a sum of 62 lakhs, which is within a few pence, as it were, of the actual cost?

A.—No.

Q.—That is what is said.

A.—I have not got Sir Lawless Hepper's evidence, but Sir Lawless Hepper said that I produced an estimate and took it away and put 100 lakhs on it.

Q.—May I see that document? (*Same handed to the Chairman*).

A.—May I continue with my explanation?

Q.—Please do?

A.—What happened was that this estimate of mine, the original estimate, was for 499 lakhs of rupees. That had in it " Roads, lights and drains 75 lakhs." I maintain that was roads, lights, and storm water drains. I had an interview with Sir Lawless Hepper on the 14th February. I had a long talk with him, and the note in my private diary is: " At office and saw Hepper and had a long talk about my report." What Sir Lawless Hepper said was that he did not want to have the estimates constantly being increased, that he knew from conversation that I had not included sewerage. He was then aware that Mr. Lewis was preparing an independent report; and he asked me to put on my report—he mentioned the figure—about 100 lakhs of rupees. Sir Lawless Hepper and myself discussed how it should be put on, and we put on so many lakhs for moorum topping, and we put on so many lakhs for sewerage, not for storm water drains. In order to make it quite clear I at the time, that is on this date in February 1922, put the words " storm water drains " above " drains " and added " sewerage," so as to show quite plainly that roads, lights, storm water drains and sewerage were included.

Q.—" Sewerage " means drains, does it not?

A.—" Sewerage " means sewerage—sewerage drains, not storm water drains.

Q.—You get on the one hand " storm water drains "—that is one thing?
A.—Yes.

Q.—And drains as the other?
A.—Sewerage.

Sir Frederick Hopkinson.—And surface drains from the roads, as in London?
A.—I would rather like to emphasise this point.

Chairman.—I want you to do so.

A.—My estimate was " Roads, lights and drains," which mean storm water drains. I will show you a letter in 1921 in which I had said that we must not overlook the storm water drains. Then Sir Lawless Hepper said : " You must put on something for sewerage. We do not want to have the estimates constantly increased "; and he suggested the sum that I should put on. I have got in the entry of the 23rd February : " Long talk with Hepper, took back my estimate and put a crore on to it." It was done by Sir Lawless Hepper's instructions. He was the head of the Development Department, and he knew that Mr. Lewis was presumably making up this independent estimate, and he did not want there to be a great difference. He said : " You have not put in anything for sewerage. You must put in something for sewerage." Presumably he knew what Mr. Lewis had estimated for sewerage. Mr. Lewis was not in good health and he asked me to put it on, and here it is : " Roads, lights and storm water drains."

Q.—Was it proper for you in your opinion to put it on or not?
A.—Well, under the circumstances I thought he had already discussed it with the Governor.

Q.—That is not an answer. You were a professional man in Bombay, and adviser to the Bombay Government?
A.—Yes.

Q.—In adding those amounts to your estimate, were you in your opinion acting professionally and correctly?
A.—Yes.

Q.—You were?
A.—Yes.

Q.—That could only be because in your opinion the work would cost that amount?
A.—The sewerage, yes.

Q.—Every addition that you made by which the amount would be brought up to 668 lakhs must in your opinion have been a proper and honest addition to make?
A.—Yes.

Q.—Therefore we can leave it, can we not, that whether Sir Lawless Hepper told you to do anything of the kind, if he told you to do anything improper, you would not have done it?
A.—I should not have done it if it was improper; but sewerage was not within our contract. We were not advising for sewerage. Presumably Sir Lawless Hepper had gone into this matter. He said " Sewerage will cost so much, and I want you to put in so much for sewerage." We were not doing the sewerage; but he did not want to have a number of estimates.

Q.—You notice that in the project estimate of 702 lakhs sewerage is not mentioned at all. Item 14 is : " Equipment of area with roads and lights 49 lakhs. Equipment of area with drains, 27 lakhs. Equipment of area with storm water drains, 64 lakhs "?
A.—Yes.

Q.—There is nothing about sewerage. That is under the item drains?
A.—But that is sewerage.

Q.—It is only 27 lakhs for the whole of those. Will you produce if you can any letter in reply to Mr. O'Rorke's statement that the storm water drains were overlooked, that is that they would have to be built simultaneously with the crosswalls. In fact did they send you their proposed arrangement of storm water drains?
A.—They did.

Q.—That would be permanent work, would it not?
A.—The storm water drains—yes.

Q.—Ought not you to have got out the plans for it?
A.—Certainly we should have got out the plans for it, but apparently Sir Lawless Hepper said we were not to get out the plans for it.

Q.—Why did you not get out the plans for them before 1923?
A.—Because we had not got the town planner's lay-out until March, 1922.

Q.—Then let us get the facts. The plans for this permanent work came from Bombay, and on the 18th April, 1923, you wrote a letter saying : " We have examined the

proposed arrangement of storm water drains as shown on the plans handed to Mr. Halcrow," and then you have a discussion about the design and method of construction.

A.—Is that correspondence in Bombay or London?

Q.—It is in London, April 18th, 1923, Messrs. Meik & Buchanan, 16 Victoria Street, sending to the Chief Engineer suggestions which have arisen after the examination of your suggestions as regards the storm water drains.

A.—Might I ask the date of that letter?

Q.—18th April, 1923.

A.—Might I point out that in January 1923, or before that date, Sir Lawless had said we had nothing to do with the storm water drains: and he is the Director of Development.

Q.—That is true, but my point is this, and I want an explanation of it because it is a point which has been made so much of in Bombay. It is pointed out that you got into the year 1922 even without yourselves having put forward the plans for the storm water drains. It has been said all the way through one of the first things Sir George Buchanan ought to have sent out were plans for the storm water drains. He has never sent them out because he overlooked them.

A.—Well, I disagree. There is sufficient proof in the letter in 1921 that I did not forget them.

Q.—We must telegraph to Sir Lawless Hepper and ask him to look up his files, because that is a letter we ought to be supplied with. I think we can pass on now to your statement: "I will now summarise briefly the work performed by my firm and myself. The dredger was a joint responsibility between Sir John Biles and my firm, otherwise we prepared the plans and specifications for the whole of the permanent works except in cases where the work was prepared by the Chief Engineer without our knowledge or consent. We also prepared a design for the gantry along the line of the sea wall." There has been a certain amount of discussion about that gantry. It has been pointed out that it cost some £90,000, that it was a convenient thing but not essential, and the non-essentiality of it is suggested to be proved by the fact that you did not require a gantry at the other end. What do you say about that?

A.—Well, I say that is matter of professional opinion. The question of the gantry was very carefully discussed with the late Mr. C. S. Meik and myself, and we decided that the gantry was suitable, and we adhere to that opinion.

Q.—It is suitable at the price of £90,000?

A.—It is suitable at the price of £90,000.

Q.—That is the point

A.—That is a matter of professional opinion, and we beg to adhere to our opinion.

Q.—Then on page 63 you point out: "We employed and paid Inspectors, and we furnished the India Stores Department with certificates on which the various contractors were paid." Then you say: "We employed a permanent staff in our office whose time was chiefly devoted to the Back Bay reclamation scheme. The Principals of the firm, and I in particular, devoted a great deal of our time to the work, and other remunerative work was refused or curtailed because of my obligations to visit Bombay. For the purchase of machinery and stores in this country the usual charge in fees is 2½ per cent. on the cost. We agreed to perform the work for 2 per cent. and we have only been paid 1½ per cent, which in many cases has not paid our expenses." Is it by virtue of a clause in the agreement that there was to be a postponement?

A.—Yes.

Q.—"For the dredger we were to receive 1 per cent, and have only been paid ¾ per cent." That is up to this date?

A.—Yes.

Q.—"I give these facts and figures because statements have been made as to the remuneration of my firm on the supposition that it was all profit and that we had no expenses." Running an engineers' office in Victoria Street, going out to India and sending other people out to India cannot be done without a very considerable expenditure of money?

A.—No.

Q.—"I visited Bombay once each year and twice in 1923, and if my visits were not as profitable to Government as they might have been, it was certainly not my fault, as will be seen later on in this statement." Then: "A partner (Mr. W. T. Halcrow) who is specially qualified to criticise the execution of works, visited Bombay in 1922, and made a thorough inspection of the works, and in 1925 we sent our chief assistant, Mr. Settle, an engineer of great experience, to report on the dredging. These visits were outside the terms of our agreement, and at the firm's expense." Did Mr. Settle make a report in writing?

A.—He did; it is going to be given you with his evidence.

Q.—As an appendix to his statement?
A.—Yes.

Q.—Thank you very much. " I visited Bombay last on the 24th October, 1924, and I left Bombay on the 7th January, 1925, for Australia, with the full knowledge of His Excellency the Governor (who discussed Australia with me), Mr. Cowesjie Jehangir the Member of Council in charge of development, and Sir Lawless Hepper. I intended returning to Bombay the following October, but was overtaken with an illness so severe that I was ordered by my medical adviser to go direct to England, as, if I broke my journey at Colombo and went to Bombay, he considered my life would be endangered. I arrived in London in a state of collapse, and sent a medical certificate to Bombay. The Bombay Government thereupon purported to cancel my agreement with the Secretary of State. My medical adviser is prepared to give evidence before the Committee on this point." We do not want any evidence of that character, because any question between you and the Secretary of State as to the purported cancellation of the agreement has nothing whatever to do with us in any shape or form, and is not within the terms of our reference. Now you come to the estimate of September, 1919, and I will read on page 65 : " This estimate was for lakhs 367.61, increased by Government to 400. It was at the time a fair and reliable estimate, and was accepted as such by the Government of India who examined the figures in the P.W.D. secretariat, and also by the Secretary of State who sanctioned the project." The question that occurs to me is whether there was anybody in the P.W.D. secretariat of the Government of India who was capable of following the figures of this work of a highly specialised character. By that I mean Sir Sydney Crookshank and his assistants. Those are the people, are they not?
A.—Those are the people.

Q.—Did you meet anybody there, either Sir Sydney Crookshank or his assistants, who were capable of having any opinion of the value of such a thing as the cost of the sea wall, or the cost of dredging the material?
A.—You must bear in mind that it is usual that they refer these matters very often to the Inspector-General of Irrigation, who is supposed to have knowledge of these matters. Whether they did so or not in this case I do not know. I did not meet the Inspector-General of Irrigation, but it is a very frequent occurrence, or used to be. I do not know whether there is an Inspector of Irrigation to-day, but a few years ago all marine projects would go to the Chief Engineer of Public Works, and if he was not an irrigation man, if he did not know anything about it, he would refer it to the Irrigation Branch.

Q.—You have no knowledge that Sir Sydney Crookshank or anybody in his office ever referred?
A.—I have no knowledge of that.

Q.—Was not the conversation between yourself and Sir Sydney Crookshank really the most perfunctory conversation on his part?
A.—It was not extensive; it was not an extensive conversation, no.

Q.—I use the word " perfunctory " of a man who would not have and could not be expected to have a grasp of the details of this highly technical subject. He was not an expert in it?
A.—No, I do not think Sir Sydney Crookshank was an expert in it, but, as I say, I have no information as to whether he did or did not consult anybody else.

Q.—Then you say : " The estimate was most carefully prepared from data obtained from the P.W.D., the Port Trust." What information had you obtained from the Public Works Department which was built into your report?
A.—Well, I am prepared to give details about that.

Q.—We know, of course, item No. 5, 59 lakhs.
A.—Yes.

Q.—You did not get any assistance from the Public Works Department on that head, because you never consulted them?
A.—No.

Q.—Earlier in the day I did ask you whether you went to the Port Trust people, and you said no?
A.—I beg your pardon ; I think I said I went repeatedly to Mr. Messent.

Q.—" The estimate was most carefully prepared from data obtained from the P.W.D." Let us take that first. Who in the P.W.D. gave you any data from which you prepared your estimate? What is the name of the gentleman?
A.—Perhaps you would like me to read out what I did in Bombay?

Q.—Do you mean between the 19th May and the 31st May?
A.—Yes.

Q.—I should be glad to have that. Will you give me the dates, please?
A.—I arrived in Bombay on the 19th May, 1919, and I left on the 31st May, 1919.

Q.—This is not in your statement?

A.—No, not in that statement.

Q.—This is a new statement which we have not got?

A.—It is a supplementary statement.

Sir Frederick Hopkinson.—This is the one we were promised but which we do not seem to get.

A.—I thought you said you were getting on to this on Monday.

Chairman.—We will follow it.

A.—It is not very much.

Chairman.—We had thought that the statement which was delivered to us would be complete.

Sir H. Courthope-Munroe.—It would have been, but in an inquiry of this kind so much crops up from time to time that Sir George has made some additional notes. These additional notes were made in rather a long form as notes, and I thought it was better to put them under a heading, so that you might have the various headings, and I have had them broken up under the headings.

A.—These are my private notes.

Chairman.—Never mind; will you read it in your own way? We will follow it as closely as we can, and you can give us a copy as soon as it is available.

A.—I arrived in Bombay on the 19th May, 1919, and I left on the 31st May. I spent the greater part of the time in the Public Works Department secretariat, discussing Mr. Kidd's scheme in detail with the Public Works Department officials.

Q.—Who were they?

A.—Particularly Mr. Kent and Mr. Trench. I was there every day, or practically every day, while I was in Bombay. I inspected the site of the works on several occasions. I examined the works in progress in connection with the Kennedy sea face wall, which forms the beginning of the present scheme. I saw Mr. Messent, the chief engineer of the Port Trust, upon several occasions, and got a great deal of information from him.

Q.—When did he die?

A.—He was not dead then. I cannot give you the exact date of his death, but he certainly was not dead then. I obtained prices of stone and other material both from the Public Works Department and Mr. Messent of the Port Trust. The following is a list of the principal questions I asked these officials. I have one of the original lists that I sent out there: Price of coal in Bombay to-day and pre-war. Price of Portland cement in Bombay to-day and pre-war. Price of sand in Bombay to-day and pre-war.

Chairman.—Have you got their answers?

A.—I have got their answers to some of them. Price of broken stone in Bombay to-day and pre-war. Present cost of concrete in mass 1 to 6. Present cost of concrete in blocks. Present cost of basalt masonry facing in quay wall per cubic foot. Present cost of granite coping in quay wall per cubic foot. Present cost of moorum filling per brass at Sewri. Cost per lineal foot of the Sewri retaining wall, with cross-section of same. Fair percentage to add to pre-war dredging costs to bring them to date. Price of basalt rubble in revetment or quay wall work. Whether the steam navvy brought by the Port Trust from the G.I.P. Railway for working at Trombay is a success, and are there any details of the cost? Have the Port Trust any comparison of cost of moorum filling by rail and by water, respectively, from Trombay? Also obtain prices of moorum filling from Improvement Trust. I discussed many of these matters with the officials in question, and I got to know all this information.

Q.—Have you any document from Mr. Trench or Mr. Kent answering those questions?

A.—I do not think I have anything from Mr. Trench or Mr. Kent, but I have from Mr. Johnson, who was in charge of the Kennedy sea face wall. When I got together all the information I could I left for England, and I took in hand the preparation of my report and estimate. In this I was greatly assisted by my late partner, the late C. S. Meik, and by records in our office of the cost of work of all kinds for the last 40 or 50 years. Finally we decided on the prices for construction work at about two and a-half times above 1912 prices. Let me give a few examples to compare Mr. Kidd's estimate with mine. In 1912 Mr. Kidd estimated the cost of the sea wall at 288.15, or 289 rupees a lineal foot. We considered that price high, distinctly high, for 1912; but our price for 1919 for a much cheaper wall was 531.4 rupees, which was undoubtedly ample at that time. In the matter of dredging, the chief engineer of the Bombay Port Trust informed me that the working costs had only increased in Bombay approximately 25 per cent. between 1914 and 1919. Mr. Kidd's estimate for pumped filling, mud and clay, was 9 annas 3 pies per cubic yard. In his evidence he gave the estimated cost of his plant in 1912 at £287,625, which, converted into rupees

at 15 to the £ and divided by 25 millions, comes to 2.7 annas a cubic yard. My 1919 estimate was for a dredger and other plant to cost £451,500. That was the firm offer we had at the time. To reduce that to the 1912 price, that is two and a-half times in excess, and you have £180,600, or exactly £100,000 less than Mr. Kidd's estimate. Let us put on £20,000 for contingencies, boats and barges, and say that the dredger and plant would cost £200,000. That is 30 lakhs divided by 25 million cubic yards, giving 1.90 per cubic yard for plant. Accordingly, the late Mr. Russell, then Secretary to the Government of India's Public Works Department, agreed the figure of 2.16 annas per cubic yard was a fair price for the work and the pipe-lines and dredgers, which he quoted from actual experience. Taking 1.90 plus 2.16, it equals 4.06 per cubic yard against Mr. Kidd's estimate of 9 annas 3 pies. In my revision of Mr. Kidd's estimate, as I tell you, I was assisted by Mr. Meik, who had very great experience. I allowed 5 annas, and we considered that was generous. We considered that on the item of dredging Mr. Kidd had over-estimated by 64.19 lakhs of rupees. In my detailed estimate plant amounts to 3.24 annas, and working expenses 2.66, totalling 5.91; but I add for contingencies 2.09, which should be ample. My point is that we went into the matter as carefully as we could and we came to the conclusion at that time—and we were justified in doing so—that Mr. Kidd's estimate was very gravely over-estimated. As regards the wall, we increased the wall from 288, or whatever it was, to 500; but we considered that he had over-estimated for his dredgers and working costs.

Q.—In fact, did the cost of the " Colaba," the " Sir George Lloyd," the " Kalu," the " Jinga," the pipe-lines and pontoons themselves exhaust the 8 annas?

A.—I am referring to my 1919 estimate, not to what happened subsequently. At my 1919 estimate we did have a firm offer for the dredger at a certain price.

Q.—But in 1919 you estimated that 30 million cubic yards could be dredged for 8 annas a yard?

A.—Yes.

Q.—In fact, did it cost the whole of the 30 million 8 annas to provide the dredging plant, as it turned out?

A.—I can give the reasons for that.

Q.—I am only asking you the question.

A.—Certainly it did, but I do not think that proves my estimate in 1919 at that time was incorrect.

Q.—You estimate that you will provide 30 million cubic yards of material dredged from the harbour transported across the peninsular and put on the reclamation?

A.—Yes.

Q.—That can only be done by the provision of adequate dredging plant, by the provision of crews, by the paying of five seasons' cost of wages, reconditioning of vessels, and so on. Did not the first item of all, the provision of the " Sir George Lloyd," the " Colaba," the " Kalu," the " Jinga," the pontoons and pipe-lines, exhaust the whole of the 8 annas before a single ounce of material had been dredged?

A.—I am not disputing that, but we are discussing now how I got at my 367 lakhs' estimate.

Q.—Would you continue? Would it be possible for us to have a copy of that statement to-morrow?

A.—Yes.

Sir Frederick Hopkinson.—I should like to see all the details.

Sir H. Courthope-Munroe.—I will try and see that you have these figures. I got them out for the very purpose that you should have them. It is almost impossible to follow it unless you have them in front of you.

Chairman.—It is quite impossible.

Witness.—We thought that this part was coming on on Monday.

Chairman.—But we must have a little time to study it. I am going to leave some of these matters to Sir Frederick Hopkinson, and he would like to see the details and have time to study them. Will you bring all the original documents on which you have made the calculations?

A.—I will bring certain documents. With all deference I am not going to lay bare the details of my office working for Sir Frederick Hopkinson.

Chairman.—You must do as you like, but it has been definitely stated by Mr. Lewis and Mr. Elgee that they never saw and they never knew of the existence of any document showing how 367.61 lakhs was arrived at. They were asked over and over again in various forms: " When you were in Sir George Buchanan's office were you ever shown any documents saying how 367.61 lakhs was arrived at? "

A.—There was no particular reason why they should have been told. They joined the work long after that time. There is no particular reason why they should have been informed how the estimate was arrived at.

Q.—Mr. Lewis came over in 1920, you remember?

A.—Yes, I remember.

Q.—Mr. Lewis helped Mr. Meik in the preparation of the plans and the plant, and everything to be ordered?

A.—Yes.

Q.—You went off, I think, to South Africa on the 25th August of that year?

A.—Yes.

Q.—Mr. Lewis says: "I cannot tell you in the least how the 367.61 lakhs as set out in the report was arrived at, because never during the whole period that I was in the office did I ever see any figures."

A.—No; I do not think it was discussed with him.

Mr. Billimoria.—I submit as a Committee we are perfectly entitled to ask Sir George Buchanan to produce these estimates, because the whole scheme was based on the original figure of 367 lakhs. If Sir George Buchanan declines to do that we shall draw our own conclusions.

Chairman.—It is perfectly evident if Sir George Buchanan has got the original figures on which he arrived at the estimate of 367·61 lakhs, he will produce them as a matter of prudence, as a matter of the proper and right thing to do. There cannot be any question about that: there will be no question about it.

Sir Visvesvaraya.—How were the officers to carry on the work if the details were not given to them?

Chairman.—We will follow that out. For the moment the question is that Mr. Lewis said he never saw how this amount was arrived at. If there are figures in existence between May, 1919, and September, 1919, Sir George Buchanan undoubtedly by Monday will produce this original document. Will you continue those figures?

A.—I think that is the end of those figures at present.

Q.—Very well. That is the P.W.D. Have you got any letters from Mr. Kent or Mr. Messent or Mr. Trench dealing with any of these matters?

A.—No, I have not.

Q.—As regards the Port Trust, what were the data which you obtained from them?

A.—I have read out that—data on prices.

Q.—From the Port Trust what did you get? I have not followed that part of it was from the Port Trust.

A.—I practically got all this information from the Port Trust; I got all this information from miscellaneous sources in Bombay, and it was quite sufficient; and with our information at home we got out our figures. As I have said before, Mr. Meik is dead and one cannot call him, and I am not going to produce the records of my office for years and years past or give details more than I have done.

Q.—You must decide; but let there be no misunderstanding about this. You must decide yes or no whether when you are asked on Monday to produce the original figures you will do so. I hope, Sir Harry Courthope-Munroe, that you are listening to this?

Sir H. Courthope-Munroe.—I am listening attentively.

Chairman.—You must decide by Monday, yes or no, whether you are going to produce the details by which you arrived at 367·61 lakhs as set out on page 29 of your report.

A.—Yes.

Chairman.—If you say you will not produce them, well and good.

Mr. Billimoria.—I might point out that he has been paid for it, and we are entitled to these documents.

Chairman.—Do not let us carry it any further than I have carried it; we will wait till Monday.

Mr. Billimoria.—It is only to be perfectly frank that I am saying this.

Chairman.—Mr. Billimoria only wants to put the point to you. I see the point now, that at that time you were being paid to get out this document.

Mr. Billimoria.—It is our property therefore.

Chairman.—It is a good point, and I am sorry I stopped you.

Sir Frederick Hopkinson.—Under his agreement with the Secretary of State, all the documents are the property of the Indian Government.

Chairman.—You will consider it, and Sir Harry will advise you.

Sir H. Courthope-Munroe.—I will think of that. I understand the Committee would like the information he has stated there as to the price of coal pre-war, and the price of stone and cement.

Chairman.—In addition to that, on page 29 of the report you will see there is a revised estimate, and it shows that in Sir George's opinion the work can be done for 367·61 lakhs. Mr. Lewis has said this is a mere skeleton estimate, and, if you look at it, it is.

Sir H. Courthope-Munroe.—It speaks for itself.

Witness.—Will you let us know what you want?

Sir H. Courthope-Munroe.—I want you to follow the Chairman.

Chairman.—What we want is to have the details by which the sums were worked out.

Sir H. Courthope-Munroe.—You would like to have reasonable details of the statement on page 29?

Chairman.—Not reasonable; but the actual original documents of 1919 by which Sir George Buchanan arrived at the figure of 367·61 lakhs.

Sir H. Courthope-Munroe.—What you want to get at is the document showing, to take the first item, that in point of fact the quantity was 79,831, and not some other figure?

Chairman.—Yes; and how he got at that.

Sir H. Courthope-Munroe.—That is what you want to know.

Witness.—How we got at the quantities?

Chairman.—Treat it as a summons for particulars—you know exactly what I mean.

Sir H. Courthope-Munroe.—That is what I was endeavouring to do.

Chairman.—Treat it in that way, I should say: "Particulars of the quantity of 79,831, stating how, and in what manner the same is arrived at, and identifying the document."

Sir H. Courthope-Munroe.—I appreciate that.

Chairman.—Very well.

Sir H. Courthope-Munroe.—I take it what you really want is particulars of that column; there is nothing else?

Sir Frederick Hopkinson.—The prices.

Chairman.—The prices are of some importance.

Sir H. Courthope-Munroe.—Where are the prices?

Chairman.—In the next column.

Sir H. Courthope-Munroe.—Except that item No. 12, which is a lump sum—that I follow, and I will endeavour to get the best information I can about that. But in all these things there is a limit. One does not bring into a public court the whole of one's business. These matters I can deal with I have not the least doubt.

Chairman.—Nobody wants that done, but as Mr. Billimoria has pointed out, Sir George Buchanan was at this time the paid expert of the Government, and he brought these figures into existence by virtue of the relationship between himself and the Government, and they have the right to know how this was arrived at.

Sir H. Courthope-Munroe.—I am not disputing that. You must be satisfied that these are not guesses, but these are figures actually got out in a proper way.

Witness.—I would like to point out that there are no details of prices. Prices are discussed verbally. Perhaps Sir Frederick Hopkinson is under the impression that there was any detail of this estimate, and that it was got out by means of contractors' estimates; but it was not.

Chairman.—That is what we want to know.

Sir H. Courthope-Munroe.—If you have not got any documents, obviously you cannot produce them, and you will tell the Committee so. If you have any documents, it is quite fair that the Committee should see them.

Chairman.—All we want is the documents which form the groundwork from which page 29 was worked out—the calculations. When Mr. Kidd was in the witness-box the same question arose about his prices. He said: "Here is my estimate book; here are all the details"; and he then began to give us all the details, showing how he had

got out his estimate of 325 lakhs. We want a corresponding document to that, if you have it?

A.—Yes.

Sir Frederick Hopkinson.—You may have only one price in that book; but it may be built up of a dozen different things.

Sir H. Courthope-Munroe.—I quite understand.

Witness.—That is from your point of view, but not from our point of view. We do not do things in that way.

Sir H. Courthope-Munroe.—I quite follow what you are asking. You could not put it better than requiring better and further particulars. I quite agree they ought to be given, and I will do my best to get them.

Chairman.—Yes. If your client feels he does not wish to supply them we will leave it at that. At page 66 you state: "Prices were fluctuating, but nobody could see the rise of prices all over the world which would take place the following year."

A.—Yes.

Q.—You will look into that matter and before Monday be prepared to show how the prices went from 1912-1919, and how they went from 1919 to 1921 and 1922, if you like.

A.—Yes.

Q.—You say: "To give one instance, when the dredger was ordered the firm offer of £451,000 had been withdrawn by the lapse of time, and other circumstances combined to raise the contract price to over £650,000."

Sir Frederick Hopkinson.—The price actually was £773,500.

Chairman.—"To over £650,000, payable at Rs. 15 to the £ instead of 12. The Government were aware of this state of affairs and could have called a halt and asked for a re-examination of the estimate before the dredger was ordered had they wished to do so." What did your amount of £773,500 include, Sir Frederick?

Sir Frederick Hopkinson.—That is the "Sir George Lloyd," the "Colaba," the shore lines, and the floating part lines.

Witness.—Does that include freights?

Sir Frederick Hopkinson.—Yes; delivered in Bombay.

A.—I am talking of the £650,000. I will look into that.

Chairman.—I have talked of it as £650,000 because it has been mentioned as that; but Sir Frederick Hopkinson is speaking of the dredgers "Sir George Lloyd" and "Colaba," the shore lines, the floating pipe lines, the pontoons, the anchors, and everything delivered at Bombay.

Sir Frederick Hopkinson.—That is the figure from the Director-General of Stores.

Chairman.—"The Government were aware of this state of affairs, and could have called a halt and asked for a re-examination of the estimate before the dredger was ordered had they wished to do so." As the expert technical adviser to the Government it was also open to you to have pointed out to them the great difference in the few months between October, 1919 and May, 1920.

A.—As a matter of fact, I do not think I knew what the dredger was going to cost until after the order had been placed.

Q.—You knew, at all events, that prices were going up very much?

A.—Yes; and I knew that in Bombay the prices of land were also going up. We come back to the old story—the reclamation had to be done at any price. It was going to be a very remunerative undertaking.

Q.—Although you say the Government themselves could have called a halt you did not indicate that in May, 1920, it might be prudent for them not to go on with this scheme?

A.—I did not.

Q.—I appreciate the reason. It was believed it was going to be lucrative. I think I had better stop there because we get on to the revised estimate of 1921 for 701 lakhs.

A.—Yes.

Chairman.—About the statement that Sir George Buchanan has been reading from, have you got a copy for us?

Sir H. Courthope-Munroe.—I will see that you have that. I want to be perfectly candid with the Committee. It formed part of my brief, and after giving particulars of how the thing is built up, my client has made certain observations to me.

Chairman.—Of course we do not want those.

Sir H. Courthope-Munroe.—Obviously you will appreciate why it was not handed in. It can easily be got by tearing off part which is my instructions and giving you the figures. I will see that that is done. I have got them out now; but that is the sole

reason why they were not handed over the table. There were certain personal notes to me as Counsel and naturally I did not want to hand those over.

Chairman.—That is quite right.

Sir H. Courthope-Munroe.—If we deliver them to-morrow morning will that do?

Chairman.—I think so.

Sir H. Courthope-Munroe.—I will try and get out for you the further and better particulars as far as possible, but of course, it is seven years ago.

Chairman.—We do not want a new mass of particulars. We want the document and for Sir George Buchanan to say it was from this document that it was made up.

Sir H. Courthope-Munroe.—You want to test the *bona fides* of the estimate that was given. That is quite right, and I do not want to complain of it.

Chairman.—That is the point.

(Adjourned to Monday, 1st November, at 11 a.m.).

The Committee Assembled at 11 a.m. on the 1st November 1926, all Members being present.

The examination of Sir George Buchanan was continued.

Sir George Buchanan; re-called and further examined.

Chairman.—When the question arose, Sir George, of taking a shorthand note, we were under the impression that, as you had your Counsel here, you probably would not require it; and it had to be done in a very great hurry. If, however, the absence of a transcript of the shorthand notes of your evidence has put you to the slightest inconvenience, you must withhold any answers to any questions which you like, until you have seen the transcript of the shorthand note. I am very happy to hand to you now if you care to have them, my own copy, with your evidence marked at certain passages, which will give you some indication of what I, at all events, regard as of some importance. Will you just keep these copies, (handing same to Sir George Buchanan). You can return them at your leisure. As I say, if at any time you would rather defer your reply until you have had an opportunity of studying the shorthand note, by all means take that opportunity.

Sir H. Courthope-Munroe.—May I just say a word before you start, Sir?

Chairman.—Certainly.

Sir H. Courthope-Munroe.—On the last occasion when we met, you desired that Sir George Buchanan should give you further information with reference to some particulars that were stated in his report of 1919.

Chairman.—Yes—page 29.

Sir H. Courthope-Munroe.—The estimate which resulted in a figure of 367 lakhs was made up of various items, and I gathered on the last occasion that you wanted to know how the quantities were arrived at. Taking the first instance of concrete, No. 1, you wanted to know how 79,831 yards was arrived at, carrying it through in detail. Then, secondly, you desired to know how Sir George Buchanan came to fix a price, as regards concrete, of Rs. 32. You wanted those details.

Chairman.—I will tell you what we wanted. We wanted the original documents from which he worked out those figures.

Sir H. Courthope-Munroe.—I want to see if I followed you rightly. The position is this. Sir George Buchanan is an engineer, as we all know, of great eminence. He has devoted several months to the preparation of the statement which has been handed in to you, which runs, I think, to something like 117 pages. For that, so far as we know, he receives no remuneration whatever. He is here simply as a voluntary witness to afford information to the Committee. As I say, he has been several months in preparing this statement, and he has tendered himself here as a witness for the last two days. He is perfectly willing to answer any question you may put to him in fairness, but there is a limit. He is not paid to attend here. He is in no sense upon his trial. If you are to go into all these details, he may very well be required to be here for another week or fortnight; and to have all these details gone into, not, with very great respect to yourselves, by a committee of experts in the engineering world, but by your Tribunal——

Chairman.—Sir Harry, would it meet that objection if we said we would limit the examination of page 29 to one-and-a-half hours? That would meet that objection, would it not? That is one objection disposed of, then.

Sir H. Courthope-Munroe.—Sir George Buchanan has not the smallest objection to any document which he has got being seen by the Committee, but he has the strongest objection to parting with, and declines to part with, any original document. He has found a bundle in his office which came into being upwards of seven years ago. He is quite prepared to allow copies of those documents to be taken and for them to be handed to you. He is not disposed to part with the originals. You will see, Sir, that to ask a gentleman, seven years afterwards, to go into all this mass of detail may involve his attendance here at very considerable expense.

Chairman.—If we limit it to an hour-and-a-half, that point goes. All we are asking for is not that he should part with any document at all; we are asking him to hand to this Committee the original documents which he prepared, and so got out this estimate at page 29. Having handed them to us, they will remain in this room for an hour-and-a-half during which his examination is held on those documents, and they will then be handed back to him. There are two questions. Has Sir George Buchanan got those documents: are the original documents in existence? If they are, what reason does he put forward for not producing them?

Sir H. Courthope-Munroe.—May I talk to Sir George for a moment?

Chairman.—Yes. He may decline to produce them if he likes.

Sir H. Courthope-Munroe.—I am not taking up that attitude at all. You will appreciate my point. Sir George cannot hand in every document prepared seven years ago, and come before this Committee and undergo an examination that might easily last into a month. He has other things to do.

Chairman.—I said we would limit it to one-and-a-half hours. Sir George, will you turn to Sir Harry and take his advice about the matter? (Sir George Buchanan consulted with his counsel.)

Sir H. Courthope-Munroe.—I have spoken to Sir George, Sir, and upon the understanding which you have been good enough to suggest, namely, that we should hand the documents to you——

Chairman.—No, hand the documents in to whichever member of the Committee wishes to ask questions, and that the examination on page 29, as regards what you and I understand as particulars, and how they are made up, shall not exceed one-and-ahalf hours.

Sir H. Courthope-Munroe.—And that the documents will not leave the room, but will be returned after the close of the day?

Chairman.—They will be returned to Sir George Buchanan at the close of every day.

Sir H. Courthope-Munroe.—If you please. I want further to point out, as I have already pointed out, that Sir George Buchanan is unable to attend here indefinitely.

Chairman.—We are unable to sit indefinitely also. We have to be considered.

Sir H. Courthorpe-Munroe.—What I want to point out is this. Sir George Buchanan is attending here, and has drawn up this statement in the public interest, and to give the information for which you are asking. He cannot undertake, as a professional man, to attend here indefinitely at his own expense so long as this enquiry may last, and he is desirous if possible, that his examination should close to-day.

Chairman.—You may take it that that is impossible, but I hope I can get on myself to-day in a few minutes and finish by 1 o'clock. I will try to. (*To the Witness.*) I have not been unduly long with you, have I, Sir George Buchanan?

A.—I do not know, Mr. Chairman. What I would like to say is this. I am not prepared to go into the details of all that has taken place in the last seven years by question and answer. You want to have a Board of experts. I have given you all the assistance I can. I have written this statement. I have attended here for two days, but there is a limit to the time which I can spare, and I think that limit has nearly been reached. You have this statement which embodies all my views. I have given you my considered opinion to the best of my ability; and, as I say, if you wish to go into questions affecting professional skill, you require a Board of experts—a Board of Civil Engineers of the same standing as myself.

Chairman.—Have you finished, Sir Harry, or is there anything else you wish to say?

Sir H. Courthorpe-Munroe.—If you will allow me, Sir, I will take a list of the documents so that we may be sure to have them back. I think Sir George has prepared a short statement, have you not, Sir George, showing how the figures are arrived at?

Sir George Buchanan.—Yes.*

* See Appendix XII.

Sir H. Courthorpe-Munroe.—Will you give the Chairman and myself a copy of it? This, Sir, is the original bundle which has remained untouched since 1919 (*handing same in*). Before I sit down I desire to say this, Sir. The following account has been published in some of the Press reports of this case, in particular the Manchester Guardian: " (*The Chairman*). You must decide before Monday Yes or No, whether you are going to produce the details on which the estimate was based. If you say you will not produce them, well and good." I do not complain of that, but now, Sir, Mr. Billimoria is reported to have said this—I did not quite catch it myself—" He has been paid for it. It is our property, and should be produced." Now, Sir, that is an entirely wrong position. Sir George, as an eminent professional man, was called upon in 1919 to make a report. For the purposes of that report he went into considerable detail in various matters and made a considerable number of notes, as I have said, as any gentleman would do. He made his report in 1919, and was paid for that report, and there is an end of it. In 1921, two years afterwards, the contract was entered into; and how it can be suggested that any professional man can be called upon to produce his own private notes, or rather that they belong to the Government, I entirely fail to see. However, I do not want to pursue that. I think the statement was made by Mr. Billimoria in error.

Mr. Billimoria.—I am quite prepared to argue that point, if you want it to be argued.

Sir H. Courthope-Munroe.—However, that being so, Sir George rather resents that suggestion. On the question of the shorthand notes, Sir, I understand you have handed to Sir George the shorthand notes, but we on the other side of the table have rather a grievance. When Sir George agreed to enter into this enquiry he understood that he would be in the future, as in the past, supplied with the shorthand notes, at your orders. Observations are made from time to time which one fails to catch, and one wants to verify them on the following day. We have no shorthand writer here. If this were an ordinary Private Bill Committee before which matters were in contest, we should have a shorthand note taken at our own expense, but inasmuch as in this case we are attending here in the public interest, entirely unpaid, and entirely with a view to clearing up matters to your satisfaction and to the satisfaction of the authorities, we do expect that the shorthand note will be given to us day by day. It may have been by an unintentional error, but we did make application for the notes, and we were refused them.

Chairman.—I have given them to Sir George, and I have helped to clear up the matter as far as possible. If he is in the slightest degree embarrassed by not having had the shorthand notes, he is at liberty to ask to be allowed to reserve any questions till to-morrow morning, by which time he will have had an opportunity of studying the shorthand notes.

Sir H. Courthope-Munroe.—I am very much obliged to you, Sir.

Mr. Billimoria.—Before you begin, Sir, may I point out, with regard to the matter raised by Sir George Buchanan that he does not want to be here indefinitely, that this Committee was held up for a period of more than 12 days for the convenience of Sir George Buchanan. During all that time the Committee were doing nothing. We had come here all the way from India to expedite our work, and we were held up for a number of days for no fault of our own. It is no good alleging now that we are putting Sir George to any inconvenience. On the contrary, we have tried to consult his convenience to the best of our ability.

Sir H. Courthope-Munroe.—On the question of the shorthand note, Sir, I refer you to a letter of the 17th August 1926 sent to us from the India Office. The last paragraph runs in this way: " The Committee state that they have already sent to your firm a transcript of the proceedings up to date, and also a copy of Sir William Hepper's statement, and will continue to keep you so informed." That is what I was complaining of. We have not been so kept informed. I understand you have now very kindly handed copies to Sir George, and that we shall now have the notes.

Chairman.—As a matter of practice, Sir George, the Committee have sent you from India mail by mail all the evidence that has been taken, have they not?

Sir George Buchanan.—That is right.

Q.—That was done with the object of assisting you, and I hope it has been of assistance to you?

A.—It has been of the greatest assistance.

Q.—I am very glad to hear that.

A.—Would you like me to read my statement accompanying the production of the detailed estimate?

Q.—Relating to Page 29?

A.—Page 29 of what?

Q.—Of your report—not of your statement.

A.—May I give you a copy of this for reference? (*Handing document to Chairman*). " My estimate dated 1919 contains all the necessary information to enable any responsible person to form an opinion as to its reliability. It contains very much more detail than Mr. Kidd's estimate, although Mr. Kidd's was supposed to be a working estimate whilst mine was in point of fact the usual preliminary engineering estimate which an engineer makes to his client. It was accompanied by no working drawings and was not supposed to contain details. Mr. Kidd, on the other hand, is supposed to have prepared and submitted a complete detailed working project, which was accompanied by ten sheets of drawings. It was handed to me as such for examination and report. The Government of Bombay, in sending this scheme to the Government of India, had observed the drawings might be considered as complete working drawings which would give sufficient information for examination of the design and for the immediate commencement of the work. All doubtful points had been settled, and the revised estimate might be accepted as completely trustworthy and ample. I repeat that Mr. Kidd's estimate was devoid of detail, whilst mine was full of detail in comparison with the estimate of Mr. Kidd. It is not usual for an engineer to explain in any greater detail than I have done how my estimate was prepared. It contained at Page 13 a comparison of Mr. Kidd's estimate of cost with my estimate of cost for 1912, and under Table B. my estimate of cost in 1919. It also contained at Page 29 the detailed estimate of the cost of the scheme on my lines; that is the number of cubic yards of concrete rubble, concrete blocks, murum filling, etc., with prices affixed against each. I will now describe how I arrived at my estimate to Mr. Kidd's scheme, 1912 ". It really means the comparison of the estimate. " In the first place it was necessary to take out a complete schedule of quantities for Mr. Kidd's scheme, and although Mr. Kidd had given no such schedule in his report, we were enabled to do so by taking Mr. Kidd's drawings, and from them get out *de novo* the whole of the quantities contained therein. This we did, and after putting our rates under each item we arrived at a total of 170·94 lakhs. To this we added Mr. Kidd's item of 59·45 lakhs for roads, lights and drains, and engineers' and contractors' commission, 11·51 lakhs—total 241·90 lakhs against Mr. Kidd's 325·23 lakhs, and we came to the conclusion that Mr. Kidd had over-estimated the work to the extent of 83·33 lakhs. We then went on to our own estimate and dealt with it in a similar way. We took out the whole of the quantities, and from information in our office, affixed what we considered were the correct rates.

Sir Frederick Hopkinson.—This document does not say " and ". It says " We took out the whole of the quantities from information in our office "?

A.—Well, put in the word " and ".

Sir Frederick Hopkinson.—It makes a difference, does it not?

Mr. Billimoria.—I cannot understand the plural number that is used there. This report is signed " Sir George Buchanan " and not by the firm.

Witness.—" and from information in our office affixed what we considered were the correct rates, and we arrived at a total of 367·71 lakhs. Our estimate was based on an increase of two and a half times over 1912. Information I obtained from Bombay, and brought home with me, is as follows: List of prices of work done on the Kennedy sea face in 1912 and 1913 and 1919 and 1920 obtained from Mr. Johnson, Executive Engineer, Presidency, in charge of the Kennedy sea face works; letter from Mr. Messent, Chief Engineer of the Port Trust, dated 30th May, 1919, with a list of prices in Bombay for various classes of work in 1914 and 1919; rate for murum filling, Improvement Trust Scheme, 1919; letter from Mr. Trench, Assistant Secretary to Government P.W.D., Bombay, containing cost of rubble and cost of stone at Port Trust quarries; note by Mr. Trench, Assistant Secretary, P.W.D., concerning cost of Kennedy sea face wall; note giving price of timber by Mr. Pearson; cross-section of the Mazagon Sewri reclamation wall supplied by Mr. Messent, with note of the cost of concrete blocks 1917 and 1919. Above information along with the records in our office of the cost of works of all kinds, enabled us to put prices to our schedule of quantities."

Chairman.—Then you have got here, in this room, Sir George, the original figures by which you worked out this column of quantities?

A.—I have, yes.

Q.—May I have it?

A.—Here is the document (*Handing in same*).

Sir H. Courthope-Munroe.—I think that contains 45 documents, if somebody would check it. I have not numbered them.

Chairman.—Would you like that numbered, Sir Harry?

Sir H. Courthope-Munroe.—I think it would be convenient.

Chairman.—Mr. Ewbank, will you number this document and then hand the file to me?

Sir H. Courthope-Munroe.—Those are original documents.

Chairman.—Thank you. (*To the Witness*). Have you by any chance the ten sheets of Mr. Kidd?

A.—No, I have not. They were returned to Bombay and are not in my possession. They are the property of the Government of Bombay.

Q.—I am not touching on Page 29, Sir George. Your figure was 367·61, was it not?

A.—Yes.

Q.—And Mr. Kidd's was 325·43?

A.—I suppose it was that.

Q.—Say 325. When you went to Delhi did anyone at Delhi ask you how it happened that if Mr. Kidd's estimate of 325 in 1912 was a fair estimate, you were able to do the work in 1919 for 367?

A.—I do not remember at this period of time. It has not impressed itself on my memory.

Q.—The position is rather curious?

A.—Yes.

Q.—The Government of India had rather pledged themselves to the excellence of Mr. Kidd's estimate?

A.—Yes.

Q.—Mr. Russell had spoken in high terms of it. Everybody in the Government of India must have known that between 1912 and 1919 the prices of everything had gone up at least twice?

A.—Yes.

Q.—But they never mentioned it, as far as you can remember?

A.—As far as I can remember they never mentioned it at all. I put two and a half times on to the price. May I look at that book for a moment? (Document handed to witness). *There* is the original document, dated 18th October, 1919.

(*Original document*, 1919, *No.* 1).

Q.—Now, Sir George, if you could have done the work for 367 lakhs in 1919, working back on the basis of prices having risen two and a half times, Mr. Kidd ought to have been able to do it for 146 lakhs, ought he not?

A.—I am not prepared to discuss it in that way.

Q.—I wish to know your view about it. Is not that the fact? If you could have done it for 367 lakhs in 1919, and your own was a fair and proper price, it follows as a matter of arithmetic, does it not, that Mr. Kidd ought to have been able to do it for 146 lakhs?

A.—I do not care to answer the question in that way. I got out a separate estimate on Mr. Kidd's scheme, and I am not prepared to answer the question in that way. You can take my estimate by Mr. Kidd's scheme, and you can take my earlier scheme, but I do not care to make any comparison in that way.

Q.—Are you not prepared to answer it because you realise that 146 lakhs in 1912 would have been an impossibly low figure?

A.—I did not go at it from that basis at all. I took it on Mr. Kidd's quantities and I put my prices to them, and it never occurred to me to work it out that way.

Q.—I am sorry; I may not have made my question clear. What I asked you was, are you not prepared to answer that question because you realise that the work could not possibly have been done for 146 lakhs in 1912? Is that the reason why you do not wish to answer it?

A.—I am prepared to say it could not have been done for less than my estimate on Mr. Kidd's work.

Q.—I will leave it if you say you prefer not to answer the question, and I will put it again so that there may be no doubt about it. If your estimate of 367 lakhs in 1919 was a feasible estimate, and the right and correct figure, that means, does it not, that Mr. Kidd's estimate in 1912 ought to have been 146 lakhs. Do you prefer not to answer that question.

A.—I prefer not to answer that question.

Q.—If the shorthand writer takes that down——

A.—I have already said that my estimate upon Mr. Kidd's scheme was 241·90 lakhs.

Q.—We will have it any way you like. Let us say that 242 lakhs was the rock bed figure of Mr. Kidd's scheme?

A.—That is it, yes.

Q.—Multiply 242 by 2½ and you get 606. Ought not your estimate to have come out to over 600 lakhs?

A.—No.

Q.—Why not—two and a half times 242 is 605?

A.—Well, there are the figures, and you can make anything you like of them.

Sir H. Courthope-Munroe.—Have you put to the witness, Sir, whether he accepts the two and a half times rise in the period?

Chairman.—He says in his own statement two to two and a half, and we have got evidence, Sir Harry, which shows two and three-quarters. Two and a half will do. Yes, he does accept that. (*To the Witness.*) Now I want to come on to a completely fresh point. Will you turn to your report which you have in your hand, at Page 6, lines 10 to 13. If you turn to the previous page you will see that it is a letter from the Government of Bombay to the Government of India of the 6th December, 1911. It is one of the letters which I might describe as letters pressing on the urgency and financial success of the reclamation?

A.—Yes.

Q.—Apparently the letter of the Government of India had been written by Mr. Porter?

A.—Yes.

Q.—Because at Page 6 it says " In Mr. Porter's letter under reply it is stated that experience of reclamation by suction dredging is limited in Bombay " (the word " limited " is in inverted commas). " I am therefore to point out that the large reclamations being carried out by the Port Trust afford exceptionally complete data for estimating work of this kind "?

A.—Yes.

Q.—We must assume, of course, that the writer was honest when he made that statement, must we not?

A.—Yes, it was a Government letter.

Q.—We must also assume, must we not, that he was very ignorant of the performances of the " Jinga " and " Kalu "?

A.—Presumably he was. He was not an engineer.

Q.—But it does not require an engineer to know that if a vessel is guaranteed to do 2,000 cubic yards an hour and does 555, you are getting something less than what you bargained for?

A.—Yes.

Q.—Have you seen the 1915 publication of the working of the " Kalu " and " Jinga "—the official publication?

A.—No.

Q.—There was an official publication said to have been written by Mr. Messent, in which he set out the whole record of these two vessels. We have a copy of it here. The " Kalu," guaranteed to do 2,000 cubic yards an hour, did from 1,196 to 1,426. Mr. Kidd, if you remember, had given the figure of 1,480, and you have referred to that once or twice. Mr. Messent's figure is 1,426. The " Jinga " did from 555 to 1,276, and that was not over a period of a month or two but over a period of nearly five years. Their average output was 1,126, just about 50 per cent. of their guaranteed output?

A.—But yet to-day the Sewri reclamation is looked upon as a great success, and I have never heard the Port Trust complain about the finished work.

Q.—It does not alter the fact that when we are discussing the performances of the dredgers the figures are those which I have given you. Now suppose you had been in command, Sir George, of this particular work—the Sewri work—and you had found that the " Kalu " was giving 1,196 to 1,426 and the " Jinga " 555 to 1,276, and the two together were averaging 1,159, would you have been satisfied with that work?

A.—I should have said just the same as I say about this work. It is the human element. We have Mr. Kidd's evidence when he had a Port Trust dredger; he talks about the wonderful effect of a little encouragement. When he had a Port Trust dredger she did far more work and gave a better output than she had done compared with the very best output of the Port Trust. We have the evidence of one of the dredger masters. When he was asked about the " Sir George Lloyd " and about dredging elsewhere, he said, " Well, elsewhere they are out for blood: they are out for their pound of flesh, and if you do not get the percentage you get the sack." My opinion about the Port Trust dredgers is the same as about this dredger. Work done by Government, with Government control, is a very different proposition to work done by a contractor or a private company who have a free hand with their men. I do not attribute any importance to these figures.

Q.—Very well. You are satisfied with them as the performances of the " Kalu " and " Jinga," are you?

A.—I am not satisfied with them, but I say you have to take everything into consideration. I say that the human element has not been given the proper consideration.

Q.—Did you know of these figures when you wrote your report in 1919?
A.—No, I did not.

Q.—But why not?
A.—I have often discussed generally the dredging with Mr. Messent.

Q.—But it was in a public document?
A.—It was not put before me. I never saw it.

Q.—You were in Bombay—true for a fortnight only—but you were in Bombay making enquiries about the feasibility of this scheme. You were aware that there had been very extensive dredging operations carried out by the Port Trust—by the " Kalu " and " Jinga " in fact—and even if you did not see the document did you make any enquiries of anybody as to the figures of output of those two vessels?
A.—No, I did not. I had frequent conversations with Mr. Messent. Mr. Messent certainly never once gave me to understand that he was dissatisfied with the Sewri reclamation. I always understood it was a great success.

Q.—Your conversations, I suppose, consisted of questions and answers?
A.—Well, the usual conversations which people have, yes.

Q.—Was not the first question that you should have put to him in any conversation " What have your dredgers done "?
A.—I cannot remember all that I did say to him.

Q.—If you had asked him what his dredgers had done he, having written the official account, would have given you these unhappy figures?
A.—Mr. Messent never gave me a single indication that he was dissatisfied with the " Jinga " and the " Kalu." Possibly he was aware of the failing of the human element.

Q.—Returning to the passage I read—" I am therefore to point out that the large reclamations being carried out by the Port Trust afford exceptionally complete data for estimating work of this kind," that is a commendatory statement, is it not?
A.—Yes.

Q.—Would you have included that in the Report if you had known that the " Kalu " and " Jinga " had done this poor output?
A.—I merely included all this in the Report as a record.

Q.—Yes, but would you have thought it fair to include that commendatory statement in the record if you had known of the poor figures of output of the " Kalu " and " Jinga "?
A.—I should have put it in the record, certainly. This was merely an historical record.

Q.—But if in your own mind you knew that it was a mis-statement, would you have put it in your report?
A.—I did not put it in my report. I merely quoted a document.

Q.—I am trying to make it clear. Somebody makes a commendatory statement?
A.—Yes.

Q.—If you had had full knowledge of the facts you would have known that that commendation was misplaced. If you had known of the figures of the " Kalu " and " Jinga," would you have put that commendatory statement in without some remark that it was over sanguine, or something of that sort?
A.—If I had taken any notice of it at all I should have analysed it and have gone into the question of labour, machinery and material.

Q.—The human element?
A.—The human element.

Q.—I suppose whenever you did any dredging operations you were always up against the human element?
A.—I have been rather fortunate in the human element.

Q.—Were you aware that, generally, people doing dredging operations were up against the human element?
A.—Yes.

Q.—And that it was always rather a serious problem?
A.—Always rather a serious problem.

Q.—Why did not you mention that in the report?
A.—We are sanguine. We think we can get beyond the human element. When I was in Mesopotamia we did enormous dredging operations but we did not have any trouble with the human element there. Perhaps you would like to know why, Mr. Chairman,

Q.—If you wish to tell us by all means do so, Sir George, certainly.

A.—In Mesopotamia we were under military control and military law. On one occasion we did have trouble with a dredger. The whole of the crew said they would not coal the ship, and they were all sent to the Provost Marshal and suitably dealt with. We had no more trouble in Mesopotamia.

Q.—There, I suppose, the men considered that an inhuman element, did they not?

A.—In Rangoon, where I was carrying out the river training works, I was fortunately in the dual position of Sir Lawless Hepper and Mr. Lewis. I was Chairman of the Port Authority and I was also the Chief Engineer. It was a one-man show, and a one-man show you are perfectly aware, Mr. Chairman, is very different from divided authority.

Q.—Did you ever work out the cost of the dredging at Rangoon?

A.—I cannot remember.

Q.—I am told it cost 1s. 6d. a cubic yard. That was pretty high, was it not?

A.—I do not think it is fair to take any figures by themselves. You could take figures from anywhere, Mr. Chairman, and say, "Look at this and look at that." It is not fair to take any figure unless you know the whole of the circumstances.

Q.—So be it. Did Mr. Messent ever tell you about any difficulties which had arisen with the port dredger?

A.—I can assure you that he never did. I was taken to the Sewri reclamation and shown the results as a great success.

Q.—In the same letter it is said, "Further, the Government are well aware that economy in this class of work can only be secured if the suction dredgers and other plant required shall be of the best design. The difficulties which have arisen with the Port Trust dredgers serve as a warning on this point." When you saw that passage in the letter, did it never occur to you to inquire from Mr. Messent what were the difficulties which had arisen with the Port Trust dredgers?

A.—Mr. Messent was a very old friend of mine, and I was in Bombay when the works were going on. He never told me there was any difficulty at all with the Port Trust dredgers.

Q.—I have not interrupted you, Sir George, but that does not really meet the point of my question. The point of my question is, when you saw in this Government letter, "The difficulties which have arisen with the Port Trust dredgers serve as a warning on this point"—that is, "The suction dredgers and other plant must be of the best design"—did not you ask Mr. Messent, "What does that mean; what difficulties have you had with your dredgers"?

A.—No, I did not.

Q.—Look at it from another point of view, "The suction dredgers and other plant required shall be of the best design. The difficulties which have arisen with the Port Trust dredgers serve as a warning on this point." Those Port Trust dredgers you knew to be the "Kalu" and "Jinga"?

A.—Yes.

Q.—You knew them to have been built by Messrs. Simons?

A.—Yes.

Q.—You saw that this was some criticism of these dredgers?

A.—Yes.

Q.—Did you enquire of anybody what the trouble was about the dredgers built by Messrs. Simons?

A.—No.

Q.—I will now turn to your statement, page 66. You are dealing with the engineer's revised estimate of 1921. He brought his out at 702, did he not?

A.—He did, yes.

Q.—And you, a few months later, in February, 1922, brought yours out at 668?

A.—I think it was the other way about.

Q.—So be it; I do not mind which way you put it?

A.—As a matter of fact, my estimate was never considered by Government at all.

Q.—That, again, is not quite my question. I am asking you, did you not in February, 1922, say that the work ought to cost and would cost 668 lakhs?

A.—I did, yes.

Q.—In point of fact, it was before that date that you were told that the project estimate of Mr. Lewis's would be 702 lakhs?

A.—No, I do not think it was before that.

Q.—Look at your own statement: " In August, 1921, we were astonished to receive from the Chief Engineer revised estimates for the Back Bay scheme amounting to seven crores." That is on page 66, at the very bottom?

A.—Quite right.

Q.—Therefore, in August, 1921, you were aware that the engineer thought the scheme would cost 702 lakhs?

A.—Yes.

Q.—In February, 1922, you, yourself, said 668?

A.—Yes.

Q.—It is only a difference of 5 per cent., is it not?

A.—Yes.

Q.—Had you really, or have you even to-day, any great objection to the 702 lakhs? You have said somewhere in one of your documents that you agree generally with Mr. Lewis's figure?

A.—I go so far as to say that I think, under better executive control, that the work should not have cost that.

Q.—It might have been brought down to 668?

A.—It might have been brought down considerably.

Q.—It might have been brought down to your figure of 668?

A.—My figure of 668 was on actuals supplied by Mr. Lewis.

Q.—You signed your name to it?

A.—Yes, I did.

Q.—You accepted it?

A.—I accepted it, yes, but I accepted it on the work that was done. That Mr. Lewis, or that the Executive, had been extravagant was not my concern.

Q.—Did you, at that date, ever put into writing any allegation that there had been extravagance—at that date?

A.—I protested against the 702 estimate

Q.—Did you say it was extravagant?

A.—I think I used those very words.

Q.—Will you let us see it?

A.—There is a long letter which we wrote complaining about that estimate. I have not got it beside me.

Q.—Do you know the date of it?

A.—The 26th July, 1922.

Q.—Are you referring to the report dated 26th July, 1923?

A.—No.

Q.—I have not got that letter?

A.—I am referring to an official letter that we wrote on the 26th July, 1922, in which we went into some details, and we refused to accept the estimate. I can obtain the letter for you.*

Q.—Thank you, very much. Were you of the opinion that the 702 figures were, more or less, all right?

A.—The 702 figures were, more or less, all right? Well, we considered that the work——

Q.—No, no, I mean the price. Were you of opinion that Mr. Lewis's figure of 702 lakhs was more or less correct?

A.—How could we, when we said it was excessive?

Q.—I am asking you, because you said in your report on the revised project estimate, " So far as I can see, Mr. Lewis's figures are generally acceptable "?

A.—Yes. That is after the work was nearly finished. That was the revised estimate. That did not imply any criticism of what he had done in the past.

Q.—It implies acquiescence in his figures, does it not?

A.—What date was that?

Q.—1924—the last report we have. It is dated the 15th December, 1924. I will read the whole passage. " A revised project estimate for the whole work was submitted by Mr. Lewis, the then chief engineer, in July last, and was sent to us for our remarks, when we replied that the matter would be taken up by me on my return to Bombay. The sanction project estimate amounted to Rs.7,02,43,321, and the revised estimate Rs.7,26,54,401, an excess of Rs.24,11,080. There had been material savings in several directions . . . . I have gone into the matter very carefully with the chief engineer and understand he wishes to submit his revised estimate after the receipt of the actuals at the end of the financial year. So far as I can see, Mr. Lewis's figures are generally acceptable, except that the cost of dredging and filling must be an uncertain quantity

* See Appendix XIII.

until we have had the experience of this season's work, and that, in any case, there must be added the sum of 3½ lakhs for removal of cables in Back Bay, and to dredging plant 5 lakhs for the intermediate pumping station to work the "Kalu" if that is approved, Mr. Lewis having already allowed 5 lakhs." There is no criticism there of extravagance or inefficiency, is there?

A.—There could not be. It was not possible. Allow me just to explain for one moment. The 702 lakhs estimate had been accepted by Government. That was done. It was accepted by Government. Very well. Let bygones be bygones. What we were referring to were the differences between 702 lakhs and the 700 and whatever it was.

Q.—726?

A.—The 702 lakhs estimate had been accepted by Government. No one had objected. That estimate was accepted by Government. Naturally our acquiescence was in the difference between 702 and 724.

Q.—We will pass away from it with this question—that your objection to the 702 could not have been of a very serious character, because you yourself at the same time were estimating 702 less 5 per cent.—668?

A.—Yes, but on Mr. Lewis's figures. May I read a little memorandum on the subject?

Q.—Please do. We have not got it, have we?

A.—I will give you a copy of this, Mr. Chairman. The 700 lakh estimate was not our estimate and was sanctioned without our being consulted. However, it was an estimate for work sanctioned by the Government of Bombay with full knowledge of all the facts before them, and of the prices that they expected to get from land sales. However, the responsibility for sanctioning that estimate must rest with the Government of Bombay. You are probably aware that even on that 700-lakh estimate an enormous profit was expected from land sales. It was common knowledge that the 367-lakh estimate, which had been increased by the Government with my consent to 400 lakhs, would have to be further increased. Prices of labour and materials had soared upwards in the years between 1919 and 1922, and the cost of dredging plant alone had increased by something like 100 per cent. for various reasons. Even the special Sub-committee appointed by the Government of Bombay to report on the scheme remarked in their report dated November, 1925, with reference to the 702-lakh estimate: "The excess was due to the fact that since Sir George Buchanan prepared his estimate the prices of work and of materials, fuel and labour had risen considerably. Also Sir George Buchanan's estimate had been based on exchange at 12 rupees to the £; whereas, when the plant was imported in 1921 the rate was in the neighbourhood of 15 rupees to the £. However, let us go over a few main items. Sea wall: my estimate for the wall was 118 lakhs of rupees. The chief engineer's estimate was 238 lakhs, which is above 100 per cent. increase. I have always considered the wall cost considerably more than it need have done, but the chief engineer's point of view was: "I have got that estimate sanctioned by the Government, and so long as that estimate is not materially exceeded it is justified." That is the common view in India. The fact that by economising and keeping cost accounts he could have saved on the estimate did not interest him; but my revised estimate based on the chief engineer's figures was 200 lakhs, a difference at 15 rupees to the £ of £250,000. It should, however, be borne in mind that these figures are gross. No allowance is made for the recoveries and sale of plant, or for the use of the Kandivli quarry for many works outside the Back Bay reclamation, or its sale as a going concern. The quarry was particularly well equipped for that reason. It was never intended that the quarry should be debited *en bloc* to Back Bay scheme. The Director of Development had great ideas as to its use, and a geologist reported upon the value of the stone for building purposes. I wanted a suspense account opened for the quarry and the stone sold to the Back Bay scheme on a proper basis, or rather, I suggested it, but this was not done. Beginning the wall at both ends certainly added materially to the cost. On the other hand, I consider that even with my very limited powers I saved a great deal on the wall, and the chief engineer's estimate would have been exceeded but for my advice.

Sir H. Courthope-Munroe.—May I hand you, Sir, a copy of this statement?

Chairman.—Thank you. (*Same handed*).

A.—The equipment of the reclaimed area, the 700-lakh estimate, has 212 lakhs under this head. My original estimate for 367 lakhs has 75 lakhs for roads, drains, and lighting—storm water drains, please note. Nobody in this world could have prepared an even approximate estimate for the whole of this work before the Government had decided what they were going to do with the land reclaimed, and it was not until March, 1922, that the town planner's lay-out was received by us. Mr. Kidd had allowed 50 lakhs for roads, drains and lights, and I increased his estimate.

Q.—59 lakhs?

A.—Was it 59?

Q.—Yes.

A.—I increased his estimate to 75 lakhs. This was for storm water drains and a few necessary roads and lights. Sewerage I always understood would be done by the municipality. Then I go on to what I said the other day, that in my revised estimate I, in the first instance, included 75 lakhs, but Sir Lawless Hepper sent for me and said he did not want always increasing estimates, but asked me to put on 100 lakhs for sewerage and moorum.

Q.—It was on that typewritten document that you put in pencil " Storm water " right over the top?

A.—Yes; the deficiency.

Q.—Sewerage?

A.—Yes.

Q.—In pencil?

A.—Yes.

Q.—You took out the figure " 75," and substituted " 135 "?

A.—Yes.

Mr. Billimoria.—May we have this document as an exhibit?

Chairman.—I will ask that in a moment.

A.—Dredging plant: my original estimate was 58 lakhs for the dredging plant. My revised estimate was 110½, to which was added the " Kalu " and pipe lines 17¾, totalling 128·38 lakhs. The chief engineer's estimate was 142 lakhs. That has since gone up to 162 lakhs, the " Kalu " and pipe lines having cost no less than 31 lakhs. I think the purchase of the " Kalu " was bad business. If she had been properly inspected prior to the purchase she certainly would not have been bought; but I had nothing to do with the inspection or the purchase. The increase in the cost of the " Sir George Lloyd " over and above my original estimate was, as I have explained, unavoidable. Dredging cost: this was originally estimated by me at 3.66 annas per yard, and in my revised estimate I allowed 5 annas per yard. The chief engineer always estimated 5 annas per yard, and I think the work should be done for that amount. To make any sort of comparison between the 367-lakh estimate and the 700-lakh estimate the following deductions should be made: equipment of the reclaimed area, 136 lakhs. That is, equipment of the reclaimed area with sewerage.

Q.—Was that equipment of the reclaimed area included in the 702 lakhs?

A.—It was.

Q.—But not included in the 367?

A.—But not included in the 367. The equipment of the reclaimed area was 136 lakhs, the purchase of the " Kalu " and pipe lines, 20 lakhs, and the additional cost for beginning at both ends was 15 lakhs—these are merely round figures—making 171 lakhs. 700 minus 171 equals 529 lakhs, or a little over 30 per cent. in excess of 367.

Q.—Not 129, surely, but 132, is it not? It is 702 minus 171, making 531?

A.—Yes. The point to which sufficient consideration has not been given is the general condition of world finance and the fluctuations in exchange between 1919 and 1922. In January, 1913, the rupee was 1*s.* 4*d.* and three thirty-seconds. In June, 1919, it was 1*s.* and thirty-one seventy-thirds. In February, 1920, it was 2*s.* 9*d.* In December, 1920, it was 1*s.* 5*d.*, then falling to below 1*s.* 4*d.* In London the bank rate was 5 per cent. in November, 1919, and rose to 6 per cent. in April, 1920, and was 7 per cent. from 15th April to 28th April. In June it was 6½ per cent., and the end of July it was 6 per cent. The dredger was ordered in June, 1920, and most of the other plant in 1920, in fact, at the very top of the temporary trade boom; but I do not believe they were paid for in India until the rupee had fallen to something like 1*s.* 3*d.** These great fluctuations necessarily increased any estimate, and I hope that my other witnesses will bring examples of the increases of estimate in the case of independent estimating.

Q.—Are those statements ready?

A.—They are ready. I am just waiting to deliver them. Mr. Mattingly shakes his head, but so far as I am concerned they are ready.

Q.—May we have them by to-morrow morning at half-past 10? We are not making any complaint at all, but you gave us a statement which was extraordinarily full. Sir Harry will bear me out when I say that you have been putting in statements each day which have come rather as a surprise to us. I have no doubt they will help us, but we have not had time to fully consider them. That is the only difficulty.

A.—Yes.

Sir H. Courthope-Munroe.—I quite appreciate that.

* See Appendix XXII.

Chairman.—If Mr. Halcrow and Mr. Settle come, as we hope they will immediately on the conclusion of your evidence, we want to have had sufficient time to read their statements and appreciate them

A.—They are not long statements, I may tell you.

Q.—If you say they are ready, and Mr. Mattingly says they are not, for the moment we prefer you to Mr. Mattingly, and we should be glad to have them?

A.—I think we can promise them, so far as I am concerned, at the very latest by to-morrow morning.

Q.—That will do for us.

A.—These great fluctuations necessarily increased any estimate, and although machinery and plant only accounted for a certain proportion of the expenditure on the Back Bay Scheme, the following figures are of interest. Now this is a table which I have prepared, showing from January, 1913, and various dates to October, 1926, how much 400 lakhs of rupees would be in sterling and dollars. Briefly, the difference in sterling was this : 400 lakhs in 1919 in sterling came to £3,328,125 ; but 700 lakhs in 1922 only came to £4,648,000. Assuming that the expenditure was in sterling or dollars, that was only £1,320,000 difference between 400 lakhs in 1919 and 700 lakhs in 1922.

Q.—Through the appreciation of the rupee?

A.—The appreciation or the depreciation of the rupee.

Mr. Billimoria : May I point out that those figures do not throw any light at all on it, because the 400 estimate contained only a very small proportion for plant. This is in sterling and the rest is all in rupees, so that is no comparison at all.

Chairman.—We must remember that.

A.—If you will allow me to say so, I have said that. I have said : " These great fluctuations necessarily increased any estimate, and although machinery and plant only accounted for a certain proportion of the expenditure on the Back Bay Scheme, the following figures are of interest." These figures are produced in my attempt to assist you.

Q.—Will you continue?

A.—I apologise for these notes not all being included in the statement.

Q.—I understand it.

A.—As a matter of fact you said you must have the settlement by a certain time, and I have been working overtime getting out supplementary notes.

Q.—The case shifts from day to day?

A.—Yes. That is all I have to say.

Q.—Have you a complete copy of that which you have been referring to for us?

A.—Yes. (*Document handed in.*)

Chairman.—You were telling us, as one of the incidents of the building of the sea wall from both ends, it was necessary to have 2,000 tons of stone brought down from the Kandivli quarries, with the consequent increase of the plant at Kandivli. You remember that?

A.—I remember that; but Mr. Halcrow is going to give further evidence on that point.

Q.—May I take it very shortly from you? Did the Development Directorate put forward in a letter of the 17th March, 1922, a list of additional plant required for the Back Bay Reclamation Scheme? It is page 40 of the large bundle of correspondence?

A.—Yes.

Q.—You see there four-wheel locomotive, six-wheel locomotive, Ruston No. 20 crane navvy, and so on—a whole lot of things?

A.—Yes.

Q.—Did you come to the conclusion that many of these things were not necessary at that moment, and that some of them were not even necessary at all?

A.—Yes.

Q.—Will you look at your letter of the 11th April, 1922?

A.—Yes.

Q.—That is the letter in which you are asking them to hold their hand about incurring expense. You asked Mr. Lewis to discuss this letter with the Director. That is your cablegram?

A.—Yes.

Q.—That was with the object that if possible the Director should realise that not all of this plant need be ordered?

A.—Yes.

Q.—" We fully understand that as the work is being done without a contractor, great weight must be attached to the wishes of the Engineer on the spot in the matter of

plant and plans for execution, and we have no desire in any way to hamper you. On the other hand, it must be remembered that in addition to the actual capital cost of the plant, interest for maintaining it has to be paid, and it is desirable to economise wherever it is possible to do so without interfering with the efficiency or speedy execution of the work ''?

A.—That is right.

Q.—You wrote a letter on the next day wishing them to choose a cheaper and less powerful type of engine?

A.—Yes.

Q.—Eventually there came a telegram of the 3rd May, 1922, in which they pressed for everything that they had put in their previous letter of the 17th March, excepting one crane, I think?

A.—That is correct.

Q.—There you were clearly holding a restraining hand over them, were you not?

A.—I hope so.

Q.—It is obvious, is it not?

A.—Yes.

Q.—In this particular instance they thought, being on the spot, that they really wanted all that machinery?

A.—I would also like to point out that the letter begins : " I enclose a list of plant required, with the request that you ' take tenders for the various items and arrange for shipment.' " We are not asked our opinion.

Q.—That is true.

A.—We gave it voluntarily.

Q.—You gave your opinion, and told them that they must be economical; and you gave reasons as to why at the moment some of these things were not necessary?

A.—Yes.

Q.—Do you remember any other letter of that kind where you were advising them not to spend unnecessary money?

A.—I could not say without consideration, but probably there is.

Q.—If you can find any other letter, I wish you would let us have it. I will tell you why. You remember that you wrote a letter to the Press, did you not, in which you said: " For years I have been struggling against extravagance and inefficiency ''?

A.—Yes.

Q.—There may be other letters, but this is the only letter that I know of in which you are suggesting to them that they are spending much more money than is necessary. If there is any other letter, I would like to have it?

A.—I state very plainly that I was never in Bombay without remonstrating to Sir Lawless Hepper. If Sir Lawless Hepper was here, I should be very glad to examine him on that.

Q.—What effect did that have upon him?

A.—It did not have any effect.

Q.—Then would you have had any difficulty in getting an interview with the Member in Charge?

A.—Sir Lawless Hepper did not like me seeing the Member in Charge.

Q.—What did it matter?

A.—He was the head.

Q.—You were the Technical Adviser to the Indian Government. You were the great expert there. You advised Sir Lawless Hepper to do something and he did not do it. Was not it your duty to go and see the Member in Charge? There would have been no difficulty in seeing him?

A.—Well, I did not. You may take that as you like.

Q.—Equally there would have been no difficulty in seeing Lord Lloyd while he was Governor. You could have gone and got an appointment from his Private Secretary, could you not?

A.—Sir Lawless Hepper always considered he was the king, so far as anything of that kind was concerned. I did not go and remonstrate to the Governor. I admit I did not remonstrate with the Governor.

Q.—I suggest a visit to the Governor would have deposed the king. I want to follow that out. You would have had no difficulty whatever in getting an interview at any time with Sir George Lloyd, nor would you have had, as I suppose you would agree, the slightest difficulty in getting an interview with Sir Leslie Wilson? They must give you one. If you had gone there and told them what you now say was

happening, you would have to put to them the alternative : " Either Sir Lawless Hepper or Mr. Lewis goes, or I shall go." You never pressed matters to that extent?

A.—I never pressed matters to that extent.

Q.—In that letter also you speak of mishandling the dredger. " Mishandling " is the word used?

A.—Yes.

Q.—I dare say you noticed in the evidence in Bombay, when we called Mr. Speirs, and all these dredging-masters and assistant dredging-masters, Mr. Brims and everybody, each was asked the question : " Did Sir George Buchanan ever make any complaint to you that the dredger was being mishandled "? And each and all of them said that it was the other way, and that you were praising them for what they were trying to do. Do you happen to recollect whether you made any specific complaint that the dredger was being mishandled, and if so what and when?

A.—I do not think I ever made any specific complaint. One does not want to go and crab men who appear to be doing their best. My remarks about mishandling were made after a witness who will give evidence had written to us his report, who went out specially to make an examination for us. He will give evidence on the subject.

Q.—Going back to the plant, there were three Ruston steam shovels there?

A.—Yes.

Q.—Have you been to the Kandivli quarry frequently?

A.—Yes.

Q.—Do you remember as you approach the sheds there is the Bucyrus shovel there?

A.—Yes.

Q.—And three Ruston shovels?

A.—Yes, I know—Whitakers they are.

Q.—Did the Bucyrus cost £9,000?

A.—I believe it did.

Q.—Did the other cost £3,000 each?

A.—Something like that, I should think.

Q.—£18,000 in all?

A.—Yes.

Q.—Has any of them ever done a day's work as shovels?

A.—I do not think they have. I should like to point out, there is no reason why the Bucyrus shovel should not have worked.

Q.—The evidence was they did try to get it to work. They got a man who tried to operate it, but they had not got a man who could operate it. Then they came to the conclusion also that the face of the quarry was not wide enough. Here the fact is that neither the Bucyrus shovel nor the rest of the £18,000 worth of plant ever did one day's work as shovels?

A.—You may take it from me that they never tried to work the Bucyrus shovel.

Q.—When you went there, did you tell him to try to get it going?

A.—Frequently I said to Mr. Lewis : " What on earth is the good of all this plant if you do not make use of it? "

Q.—Then why did not you go up one day and say : " I am coming up on Tuesday, and let me see that working here at 12 o'clock when I arrive "?

A.—I was not in executive control of the work, and I had no power to order Mr. Lewis to do anything at all in connection with the carrying out of the work—I had no power whatever.

Q.—I am a little puzzled about it. I know it was somewhat of a difficult situation there, but I should have thought if you had gone to Sir Lawless Hepper and said : " You have got £18,000 worth of plant lying there. There are three steam shovels and they have never done a day's work as steam shovels," and had said : " As the Technical Adviser to the Government, and as the person who is bound to assist the Government, I suggest to you that Lewis starts on Monday morning with these shovels, and you and I will go up and see them being worked——"

A.—But Sir Lawless Hepper had already sanctioned the purchase of shovels against my advice.

Q.—That is not the point. I know the letter says so—but the point is, when you see £18,000 worth of plant lying idle, I fail to understand why you did not say to Hepper : " Look here, that plant has got to get working " ; and I do not know how he could have met it except to say : " Certainly, come along, we will go up on Monday." He must have. He could not have defied you?

A.—It would not interest him. As a matter of fact, Mr. Halcrow will give evidence. He went out with me, and we went specially into the question of plant and we discussed it.

Q.—Then I will not bother you about it. As to machines which have been lying out in the sun and wet all this time, there is no market for them, I suppose?

A.—I do not know what condition they have been kept in.

Q.—Even so, what would you think you would get for £18,000 worth of shovels which have been lying idle for four to five years out in the open?

A.—I believe they have been kept in fairly good order as cranes.

Q.—You would not expect very much for them?

A.—No; Mr. Halcrow, when he comes, will be able to tell you how he went round and looked carefully at all the plant.

Q.—Did he see £21,000 worth of cement blocks, some of which had been lying there since 1923 for the storm water drains?

A.—I should think he did; but I would emphasise the point that I was not in control at all. I had no control at all. I had no power to order anyone to do anything.

Q.—But I cannot understand how you allowed yourself to remain in association with all these people whom you are condemning, and who, apparently, worked to some extent at times. I cannot understand how you remained as expert adviser to the Government of Bombay when all this sort of thing was going on year after year?

A.—Well, there is an old adage: " Never do what you know the enemy wants you to do."

Q.—When the " Kalu " was dodging in and out of Back Bay, by running in on the tide when she got enough water under her keel, and running out just before she grounded, were you ever aboard of her then?

A.—Never.

Q.—You have told us in your statement that your view is that it is possible that the Back Bay scheme can be carried to a successful conclusion. You say: " I emphatically assert that the Back Bay reclamation scheme inaugurated by Lord Lloyd is not a failure, and there is no reason why it should not be brought to a triumphant conclusion."?

A.—That is my personal opinion.

Chairman.—I think the people of Bombay would be happy even if it were brought to a conclusion that left them even money.

Mr. Billimoria.—That is quite right.

Chairman.—Your suggestion is this. I would rather like to follow it up. Would you like me to read the whole of paragraph 7 on page 116 of your statement?

A.—Please.

Q.—" Regarding the Back Bay scheme, the position at present is that the constructional words as designed have proved an unqualified success. Grave doubts were expressed in Bombay as to the possibility of building at reasonable cost a wall strong enough to resist the force of the sea, and I was brought out to Bombay one year especially to observe the force of the waves, but the sea wall, as built, has resisted successive monsoon storms, and will, when the works are completed, provide a handsome sea promenade. The filling in of the reclaimed area by the dredgers has certainly not come up to expectations. A great deal has been said about the quality and quantity of material in the harbour and the efficiency of the dredger, but very little consideration has been given to the human element in the working of the dredgers." I need not emphasise that, but you have said that is a matter that one has to beware of, and the point is whether it is not a matter that should have been brought to the attention of the Bombay Government. " My view is that there is an ample supply of suitable material in the harbour, and that the dredger can perform all that it was required to do under its contract and specification, but that the human element has failed completely, and under existing conditions I do not see how it can possibly do otherwise. My advice is to free the work from the incubus of Government control, get rid of the whole staff before next working season, and invite tenders from contractors for the completion of the entire work." I would like to elaborate that a little bit—" invite tenders from contractors for the completion of the entire work." Would you hand over to them the " Sir George Lloyd "?

A.—Yes; I would hand over the whole of the plant.

Q.—You would hand over the whole of the plant?

A.—Yes.

Q.—That is part of the offer?

A.—That is part of the offer.

Q.—When you say hand over the whole of the plant, that includes the quarry at Kandivli, and everything?

A.—Hand over everything.

Q.—Do you happen to know any contractor in the world who would be likely to make an offer that the Government of Bombay could consider?

A.—I have not taken tenders, and I have no idea.

Q.—There are several ways of looking at it. One view undoubtedly is that the people of Bombay do not want to spend another penny on this matter. Of course if they handed over the plant to a contractor, the contractor has to be paid for his work, because he has to go and finish the reclamation, does he not? That is what he offers for the money?

A.—Yes.

Q.—I do not know whether it is conceivable that there might be another method by which the contractor might stipulate to hand over to the Government of Bombay the 250 acres of works and roads and things of that sort, and be given in exchange 300 or 400 acres of reclamation?

A.—I quite agree. There are various ways of approaching the subject.

Q.—If a contractor would come forward and put a proposal which did not involve any extra expense by the people of Bombay, there might be some means of managing this matter?

A.—I am confident that one way or other it could be done. People are just as keen to speculate in land to-day as they were in 1865, on the knowledge that in the future the land will be worth money.

Q.—You are of opinion that the reclamation should be finished in its entirety?

A.—I am absolutely of that opinion. Might I draw your attention to page 117 where I speak about the Manchester Ship Canal?

Q.—I will read on. " Mr. Merritt, the Assistant Dredging Master of the dredger ' Sir George Lloyd,' in the course of his evidence summed up the situation admirably. When asked in what respects the dredging in Bombay differed from work done elsewhere he replied ' One is run by a private company and they want their pound of flesh; if you do not turn over the percentage you have to make room for someone else.' " I gather from an earlier passage in your statement that your view is that there was no driving force behind everybody there: is that right?

A.—That is absolutely correct.

Q.—" Lastly, there has been a disposition in Bombay to treat this large work (probably as large a dredging proposition as the world has seen) on a par with the building of a house or other cut and dried operation, and the moment anything went wrong there was condemnation of all sorts and an outcry to stop work." When you say " anything went wrong " do you put your case that nothing has gone wrong except that the dredging operations have given an output less than was expected?

A.—You can put it that way.

Q.—Is not that the way Mr. Cowasjee Jehangir put it?

A.—Yes, it is notorious that long before anything went wrong at all there was difficulty. What was the reason for the hurried revised estimate of Mr. Lewis which was wanted at 24 hours' notice—it was got out on account of political agitation. He says in his letter: " Owing to political outcry I am made to do this estimate in 24 hours."

Q.—We have not in fact got that letter. I see you refer to it. Have you a copy of it? I suppose you have the original?

A.—I have got the original.

Q.—I would rather like to see it. You say that even before anything went wrong there was hostility?

A.—I do, before anything went wrong at all in 1919.

Q.—Are you looking for the passage when you say every season that you went out Sir Lawless Hepper told you of the political and personal agitation which was being carried on?

A.—Yes.

Q.—I think you have made that statement here.

A.—What I was looking for was the statement that when I went out and was staying with Sir George Lloyd he told me—nothing had gone wrong with the works at that time—that there had been four resolutions tabled in the Legislative Council to deal with my firm in one way or other.

Mr. Billimoria.—I cannot understand why you attribute the failure to political agitation, because the revised estimate of Mr. Lewis was far nearer the mark than your estimate of 367 lakhs before the works had actually commenced.

A.—I do not quite follow that?

Chairman.—I do not think he attributes the failure of the work to anything political.

Mr. Billimoria.—He said if anything went wrong it was due to political agitation.

Chairman.—No; he said when anything went wrong, then a political agitation arose. It is not *if* anything went wrong—it is *when* anything went wrong. I see you are quite right, and in your statement you do say you were told that four resolutions had been tabled: " The moment anything went wrong there was condemnation of all sorts and an outcry to stop work. That, if I may say so, is a most narrow and parochial view. The work might be regarded for India as a national undertaking, and should be completed. In this particular case there have been overwhelming reasons connected with the state of the world for the original estimate being increased. All estimates for works were similarly increased, and it would be of interest to know what increase has taken place in the estimates for the building of New Delhi. But to take one example out of many of works carried out long before the war, the original estimate for the Manchester Ship Canal was in the neighbourhood of £5,000,000, whereas the actual cost was nearer £15,000,000. Now that the work is completed you hear no complaints from the City of Manchester—which is every day reaping the benefit of this great undertaking. I emphatically assert that the Back Bay reclamation scheme inaugurated by Lord Lloyd is not a failure, and there is no reason why it should not be brought to a triumphant conclusion. The slump in land values which at present obtains is not going to last for ever, and the day will yet come when Lord Lloyd's foresight and energy in the interest of Bombay will be recognised and gratefully appreciated." That is your view?

A.—That is my view.

Q.—I have concluded my examination, and I am much obliged to you.

A.—Thank you very much—I thank you for your great courtesy.

Sir M. Visvesvaraya.—I have been asking Sir Lawless Hepper in Bombay as to who was really responsible for the works. He said responsibility chiefly lay with the engineers. Then you have been telling us, both in your statement here and in your other statement, that you had no control over the works, and that you could not be responsible. I want to ask you a question about responsibility. On the 22nd July, 1922, you wrote: " We are the actual responsible engineers."

A.—Yes.

Q.—Then in the early reports on page 12 of the pamphlet: " The firm was at all times ready to assist and advise . . . in all matters relating to the execution of the works." That is in your report?

A.—Yes.

Q.—On the 3rd June, 1922, you stated: " We are the engineers responsible to the Government of Bombay and the Secretary of State."

A.—Yes.

Q.—On the 22nd June, 1921, in a letter to Mr. Lewis you say: " We are not only the engineers for the machinery, but for the execution of the entire work."

A.—Yes.

Q.—If these repeated statements have any meaning, do not they show you are really responsible for the execution of the entire work, and you have frequently insisted upon being so recognised?

A.—No; we were responsible for seeing that the permanent works were properly done. We had no responsibility or control whatever over the execution of the works.

Q.—But you are supposed to co-operate and help in the execution?

A.—We advise.

Q.—Do you not call that being responsible?

A.—We were advisers, and God knows we gave advice until we were tired of giving advice; but we had no control over the expenditure of the money. We had no control over the workmen or over the engineers; we were advisers without control.

Q.—Was that stipulated in your contract? What was the understanding in the contract?

A.—Whatever the contract was, we can only deal with the facts, and the contract, as you know, was modified: you are aware of that.

Q.—It was slightly modified; we accept the modification to that extent. You say: " The firm was at all times ready to assist and advise in all matters relating to the execution of the works." Again you say: " We are not only the engineers for the machinery but for the execution of the entire work." On page 57 of your statement which you have now put in you say: " I wish to make it clear that we never had any direct responsibility for the actual execution of the work."

A.—No; we did not have any direct responsibility.

Q.—You did not have any direct responsibility for the actual execution of the work?

A.—Not for the actual execution of the work. May I point out that these letters to Mr. Lewis were written to wake things up. We were getting no correspondence

at all. There were no reports. There was nothing happening. A veil dropped between us and Bombay.

Q.—You have said that. Whatever the reason for that may be, you intended, or did intend, that you should be responsible for the execution of the entire works?

A.—We never intended that we should be responsible for the execution of the works.

Q.—But you say : " We are not only the engineers for the machinery, but for the execution of the entire works."

A.—The execution of the entire works is the carrying out of building the retaining walls in accordance with our specification. We had nothing to do with the employing of coolies or the subletting of contracts to sub-contractors.

Q.—You said : " We are the engineers responsible to the Government of Bombay."

A.—We are responsible to the Government of Bombay.

Q.—Now you say in this statment : " I had no intention of being anything but an adviser."

A.—I had no intention of being anything but an adviser. When the Development Directorate was created Sir Lawless Hepper was not my servant. How could I be, with all deference, anything but an advising officer?

Q.—You objected to the words " consulting engineer," but if an engineer is appointed to carry on the work by the principal, in this case the Government, and if the principal appoints an executive officer to carry on the work in consultation with you, it is not necessary that you should have control over that officer, is it? In no contract is that necessarily made a condition.

A.—You cannot control anyone when another person pays him his wages.

Q.—That is true; but the engineers have to prepare detailed plans and estimates, and to advise on every difficulty that arises. Sometimes they measure the works and prepare the bills of costs. All that is done by the engineers; but you did not perform several of those duties.

A.—The resident engineer was supposed to perform all those duties.

Q.—He afterwards became the chief engineer?

A.—Yes.

Q.—You say he was not your servant?

A.—I think his position was unfortunate on account of dual control.

Q.—He said so the other day.

A.—On the subject of our control, there was an interesting question put by Mr. Billimoria to Mr. Lewis, and I think it would be interesting if I read it. He said to Mr. Lewis : "You have had wide experience of public works in India. In your experience do you know of any instance in which the engineers or the consulting engineers remained in England, and the work was carried on in India?—(A.) No. All work done with the Public Works Department is done inside the offices on the spot. The only case analogous to that was Delhi, where the architects were in London. (Q.) They were not engineers?—(A.) No; they were architects, and their position would be the same as engineers. (Q.) They prepared the designs and inspected the works?—(A.) But they had their offices on the spot. (Q.) And their representatives on the spot?—(A.) Yes. (Q.) Here they had no representatives?—(A.) No. (Q.) Unless he regarded you as his representative? You were not paid by him?—(A.) No; I was paid by the Government of Bombay. (Q.) So you know of no exactly similar case?—(A.) No." I notice that in Mr. Lewis' evidence, and I would like to explain this to Mr. Billimoria.

Q.—These questions were put by me.

A.—I am sorry : they appear in our transcript as having been put by Mr. Billimoria.

Chairman.—Perhaps you would explain now?

A.—Quite apart from the terms of our agreement, which specified that all the staff in India should be paid by Government, the case quoted of the architects at Delhi is not analogous, because the architects at Delhi are paid 5 per cent. I am not at all certain that it has not been increased to 7½ per cent.—on the cost of the works. We were paid 2 per cent. There are cases—in fact we are carrying out large works now—where we provide the whole of the staff; but naturally we get paid a corresponding figure. I just want to make that clear.

Sir M. Visvesvaraya.—That is a separate point. You should have insisted upon an increase in the percentage. You never raised that question?

A.—I never raised the question because it was not necessary. The Government had agreed to pay for the whole of the staff, and the Government had created the Development Directorate on purpose to carry out the work.

Q.—You say if you had had 5 per cent. or so you would have arranged for these things?

A.—Yes.

Q.—You have repeatedly insisted that you are responsible for the execution of the work?

A.—For the ordinary carrying out of our plans—not for the employment of labour.

Q.—By " execution " you mean the results?

A.—The " execution " means the building of permanent works.

Q.—You have some responsibility for the progress of that work?

A.—We cannot have any responsibility for the work because we could not tell what contracts would be let.

Q.—Did you not ask for information, and was any information refused by the resident engineer?

A.—Yes. There are cases on record where we asked and asked, and we got no replies to our letters.

Q.—If that is so, as the Chairman remarked, was not it your obvious duty to bring it to the notice of the Governor, or the Member of Government?

A.—We wrote officially to the Director of Development at once.

Q.—He is like yourself, a servant of the Government; but there are higher people.

A.—He was the head of the whole Development Directorate.

Q.—That may be; but your agreement was not with him, but with the Government of Bombay or the Secretary of State?

A.—He was the representative of the Government.

Q.—But he could not be held responsible in case anything went wrong on your side—in case they did not pay you, or did not carry out their contract. Your contract was with the Government of Bombay?

A.—Yes.

Q.—Have you at any time asked the Government of Bombay why in this respect facilities were not afforded to you so that you might be responsible for the execution of the work?

A.—I considered it was the duty of the Director of Development. I had no official communications with the Hon. Member—I had no official communication at all. I used to go and see him, but I consider that it was the duty of the Director of Development, if necessary, to draw the attention of his chief, the Hon. Member, to anything.

Q.—Could not you have addressed the Secretary to Government, who was also Secretary of the Development Department, who was accessible to you?

A.—I do not quite know who it was, or how it was.

Q.—He was bound to give you a reply to any question you addressed to him?

A.—He would simply have got the reply from Sir Lawless Hepper.

Q.—He was Secretary to Government.

A. It was rather confusing. He was Secretary to Government, and he was also Sir Lawless Hepper's deputy.

Q.—As Secretary to Government he did not take instructions from Sir Lawless Hepper. He went to a member of the Council. As Secretary to Government he was Secretary to the Member of Council of the Government.

A.—I know that Sir Lawless Hepper used to go to the Hon. Member twice a week.

Q.—He was head of the Department?

A.—Yes.

Q.—They had a separate secretary for the Department. All representations to the Government should be addressed to the Secretary to Government, and they did not go to Sir Lawless Hepper unless specially referred to him by Government.

A.—Yes.

Q.—Perhaps you did not bring the position clearly to the notice of the Government in order not to create trouble, and with a view to get on amicably with everybody concerned. May that be the reason?

A.—The case of Mr. Lewis was specifically brought to the notice of the Government.

Q.—In that case they did not act?

A.—In that case they did nothing.

Q.—Did you write to them: " The work is stopped because this man is in charge. Unless you remove him I cannot be responsible "? Did you make any such statement to the Government?

A.—Yes.

Q.—Could you kindly show us that?

A.—I spoke personally to the Governor of Bombay on the matter. It is in the evidence, you will remember that.

Chairman.—I remember it, but actually your answer to Sir M. Visvesvaraya's question should be No, because he said: " Did you write to the Government direct? "

A.—No; I did not write to the Government.

Q.—But you had an interview with Lord Lloyd at which you suggested that Lewis ought to be retired?

A.—Yes.

Sir M. Visvesvaraya.—Does it not look like a contradiction when you say in one statement: " We are not only engineers for the machinery, but for the execution of the entire work," as compared with when you say: " I never had any intention of being anything but an adviser." I am not criticising it, but I want an explanation. We want information on the matter.

A.—The position was this. When this veil dropped we were getting no letters at all from Bombay.

Q.—This was before the veil dropped. I am talking of the 22nd June, 1921. You said this: " We are not only engineers for the machinery, but for the execution of the entire works." The veil came later on.

A.—It was in process then. It was then that we noted a disposition to regard us as agents for the supply of plant, and not supply us with information that we wanted about the work.

Q.—You say: " We never had any direct responsibility for the actual execution of the work. I never had the intention of being anything but an adviser."

A.—I never had any intention of having the executive control. I never intended to have the executive control of the works.

Q.—You need not have executive control. but you may co-operate with a man. You may be part of an agency, like the Directorate of Development, to carry on the work. You are part of the machinery created to carry on the work.

A.—Yes; but we could do nothing but advise. We could not order. We could not have ordered Mr. Lewis to do anything.

Q.—If your advice was not taken could not you have taken steps to bring that to the notice of the Member of Government and say: " Now, they are not carrying out my instructions. How can I be held responsible under the terms of the contract? " Was not that the proper position to take up? I am only asking you for information, and I am not criticising you.

A.—I quite understand. It seems quite reasonable; but the fact remains that we did not go to the Government.

(Adjourned for a short time.)

Sir M. Visvesvaraya.—Have you considered the contradiction between those statements that I brought to your notice?

A.—Which were those?

Q.—That you were responsible for the execution of the entire work. You have said that again and again, and now you say that you had no intention of being anything but an adviser, and that you never had any direct responsibility. What is your final answer?

A.—My final answer is that we were responsible for the plans and for the permanent works, but we were not responsible for the execution, the way in which they were carried out departmentally.

Q.—Why did not you bring to the notice of the Bombay Government anything that you found unsatisfactory? The contract was with the Secretary of State. You might have brought it to the notice of the Bombay Government or of the Secretary of State. Will you kindly tell me how that matter can be explained?

A.—We had a discussion about responsibility with Sir Chimanlal Setalvad; otherwise I had nothing to say, except that I did not protest beyond Sir Lawless Hepper. I considered he was the responsible head.

Q.—If the Government say that at the time they depended upon you, and they considered you responsible for the work, would you say that they are not right?

A.—I would say that you cannot have responsibility without control. They created the Development Directorate.

Q.—The contract did not stipulate that you should have control?

A.—I look at it from the common-sense point of view. No one can have responsibility who has not got control. You cannot make anyone responsible who has not got control. That is a common-sense point of view.

Q.—Are there any duties connected with the co-operation that you have to render as regards the work? You have to co-operate with other officers. Under the Government there was the Development Directorate, yourself, and your firm?

A.—Yes.

Q.—You were both agents working in unison to do Government work. If the Government ask you: " Why have you not fulfilled your responsibility? " you then say

that the Government Director did not give you opportunities. You could have gone over his head?

A.—I should say that I did everything possible. I regarded the Director of Development as practically the final authority.

Q.—The contract does not say so. I do not think the contract even mentions that you have to work under the Director of Development, or anything of that kind?

A.—No, he was the head; that is my answer.

Q.—The dredger has failed to give the promised output. It has given less than half of what was promised. On whom do you place the responsibility for this? Who is responsible for the failure of the dredger?

A.—The Government of Bombay.

Q.—How can they be responsible when they entrusted the works to the engineers? You were the engineers, the responsible engineers?

A.—I had no responsibility for paying the workmen on the dredger.

Q.—No, but you ordered the dredger. You, the responsible engineers, advised about the dredger, and now when things have gone wrong you say: "I am not responsible"?

A.—No. Excuse me, I say that in my judgment there is nothing the matter with the dredger, and there is nothing the matter with the material. The dredger has never had a proper show, and if you were to let a contractor work the dredger you would have a very different result.

Q.—Did you make a statement that the dredger had been dredging for nearly three years, and had failed to give the required output? Why did you not make that statement when you saw that the dredger was not doing its job?

A.—I cannot remember the exact date when we made representations, but that is my considered opinion.

Q.—In a note dated the 16th of April, 1920, you have stated: "We, as the engineers, are therefore better acquainted to express an opinion," etc. You have stated that you were entirely responsible for the working of the dredger. Does not that responsibility mean that you were also responsible for the results?

A.—We cannot be responsible for results when we had no control over the working of the dredger.

Q.—You think that the dredger can do five million cubic yards per annum. Do you still hold that the dredger can give an output of five million cubic yards per annum?

A.—Of course, I cannot guarantee an exact figure of five million cubic yards. I say certainly that she can do enough to justify the guarantee. I would not like to express an opinion until we have had the dredger working under proper conditions.

Q.—Have you yourself stated subsequently that it should be considered satisfactory if it produces two-thirds of the output?

A.—Yes, but we are now of opinion that we can get ample satisfactory material to get the whole output.

Q.—To get the whole output?

A.—Yes.

Q.—Can you give me an instance of any dredger of this size which has given 5 million cubic yards in one year, working for only 170 days? I have been examining the working of other dredgers, and the relation of the yearly output to the hourly output has never been so large as you assume?

A.—I cannot give you any instance.

Q.—You cannot give me an instance?

A.—No.

Q.—So that it is a unique working of the plant?

A.—I cannot give you an instance because I have not looked up all the records. I simply say that I have not got the information.

Q.—You recollect that the Government of Bombay telegraphed to the Government of India, and the Government of India cabled the Secretary of State: "As consulting engineers this firm should be held responsible for the construction and design of the dredger as dual responsibility is most undesirable"?

A.—Yes.

Q.—Do you want to refer to that telegram?

A.—No, I think I can remember that.

Q.—You also stated that if the dredger did not do its best you would accept full responsibility?

A.—Yes, that was right.

Q.—Now that the dredger has not done its work do you accept responsibility?

A.—No. We say that we have never had anything to do with the working of the dredger. We repeat that if you take the dredger out of the incubus of Government control and give the men encouragement and encourage them in team work you will get far, far different results.

Q.—That has not been the opinion of many people whom we met in Bombay, the persons engaged on the dredgers. They said: "Of course the machine works all right, but we cannot be sure of the output, and we do not expect an output anything like that"

A.—You have got the evidence of the Dredging Master, Mr. Merritt.

Q.—He is the assistant dredging master. He may have made one sound remark in all his evidence. That does not mean that he understands the larger problems connected with the working of the dredgers. He is the assistant out there.

A.—Yes. He was asked why the results are different here to other places where he has worked, and he said that in other places they are out for their pound of flesh, and if you do not get the results you get the sack.

Q.—It was a very sound remark?

A.—But you cannot sack people in Government service; at least it is very difficult.

Q.—You ordered the dredger before the detailed plans and estimates were prepared?

A.—Yes.

Q.—You were very particular to have your own way in handling the whole of this dredger affair from the commencement. You have stated here in a memorandum in respect of dredgers in Bombay which you supplied to the Director General of Stores, dated the 16th April, 1920, "I replied I had already discussed this part of the project with the Governor of Bombay who, I understood, would be averse to any dual control in connection with this scheme, because if the dredger failed to do its work we, the Engineers, would naturally say that as we had nothing to do with the dredger we could not accept any responsibility." Therefore you insisted on being consulted at every stage in this dredger proposition?

A.—Yes, and we collaborated with Sir John Biles.

Q.—Then again in the last paragraph of the same note you say: "We, as the engineers, are therefore better acquainted than anyone else with the work to be done, and also being entirely responsible for the working of the dredgers should be permitted to express an opinion." You were permitted to express an opinion?

A.—Yes, we worked hand in hand with Sir John Biles.

Q.—You said, "being entirely responsible for the working of the dredgers." Do you now hold yourself responsible for the results?

A.—We claim that the dredger has never been properly worked.

Q.—Why did you not suggest that you should take it over and work it under your own control two or three years ago. You found in two or three months that she did not work well. Could not you have told the Government of Bombay: "The thing has been mishandled, will you allow me to handle it"?

A.—We do not do that. We do not handle dredgers.

Q.—Then you could have placed it in the hands of others in whom you had confidence. You took the responsibility deliberately at the beginning, and made no suggestion in the interval, and now when things go wrong how can you disclaim responsibility?

A.—Long ago I pointed out to the Government of Bombay that they could not get the best work in any department without giving some inducement to men. It is against the rules of Government, as you know very well, to pay any bonuses.

Q.—They could make an exception in such cases by order of Government, or, if necessary, by getting the permission of the Government of India, could they not?

A.—They found it very difficult. To give you one example, when I pointed out that there were no cost accounts of any kind being kept no one seemed to care a straw.

Q.—That is true. You are right in that.

A.—It took a whole year to get a reply to my letter.

Q.—That is true, and that is not your fault. That does not absolve you from responsibility for the working of the dredger. They say that you did not suggest anything to the Secretary of State. "The Engineer now says that he had some disagreement with one of our officers, and he did not bring that to our notice. How can we accept his disclaimer now." What answer have you to give to that?

A.—The answer I think is that just as we were really getting to grips the Government of Bombay in their discretion said that they did not want us any more. There had been only two seasons' dredging.

Q.—There have been three seasons now?

A.—Yes, there had only been two seasons then.

Q.—1924 and 1925?

A.—We sent out an engineer with great experience in 1925. He had great experience, and he could have given some very useful information. He will give evidence on the subject of the dredger but in all his visits all the information was wasted; nobody took any notice of it.

Q.—That is not the point. The Chief Engineer was your own nominee, and there was the Development Director who was co-operating with you; in these circumstances how can the Government accept that as a proper answer.

A.—Do you say we ought to have gone over the Director of Development?

Q.—Most certainly. This thing was going to ruin everything. When things were going adrift was it not necessary to go to the Gevernment?

A.—Perhaps we were wrong but we say that we looked upon the Director of Development as the mouthpiece of Government, the man who had access to the Honourable Member.

Q.—If the Government had not had these assurances from you they would probably have consulted other experts in order to be on the safe side, but they did not do it. They left everything to you, so far as the Government was concerned?

A.—They left everything to the Director of Development.

Q —That is quite true, and they thought that you were getting on quite well with them. No big work is ever carried out without minor differences. They thought the differences were of a minor character, and that you were watching the interests of the Government, according to the Agreement?

A.—I do not think they could have thought that, but that was the position, anyway.

Q.—You now say that you had no personal knowledge of the quality of the material, and that you relied upon a specific statement made by Mr. Kidd. I am not criticising; I want facts. In one place you say that you are better acquainted than anybody else with the work to be done, and then in another place you say that you have no personal knowledge of the quality of the material, but that you relied upon a specific statement made by Mr. Kidd?

A.—Yes, we were quite satisfied.

Q.—There is some contradiction about it.

A.—No, we were quite satisfied with Mr. Kidd.

Q.—You say: "We are better aquainted than anyone else with the work to be done;" you probably also included material?

A.—Yes, we were better aquainted. We knew what was wanted.

Q.—Anyhow, you agree that from a financial point of view the reclamation scheme is a failure so far?

A.—I would not like to say that it was failure. It would not have been a financial failure if there had not been this sudden slump in land prices.

Q.—That is one reason?

A.—Supposing that land prices had been what they were a few years ago, even on a 700 lakhs estimate they expected to make 326 lakhs profit.

Q.—That was the estimate?

A.—That was the estimate.

Q.—I admit that that is one of the reasons. I admit that land values fell very considerably, and that you are justified in putting that forward. Your original estimate for the scheme was 367·61 lakhs, and you described that estimate as reasonable and reliable?

A.—Yes.

Q.—You described it as reasonable and reliable; mark the words?

A.—Yes, reasonable and reliable.

Q.—Now within seventeen months you send up an estimate for 668 lakhs, and then the Government went over your head and sanctioned an estimate for 702 lakhs?

A.—Yes. 702 lakhs.

Q.—Now the Engineers have put forward an estimate which comes to 1,000 lakhs?

A.—Yes.

Q.—An estimate which you prepared for 367 lakhs has gone up to 1,000 lakhs. In February, 1922, it went up to 668 lakhs, which was your own figure, as against 367 lakhs. Is not that an enormous difference all in the course of seventeen months?

A.—I have nothing to add to the statement that I made this morning.

Q.—I put it from an Engineer's point of view?

A.—Yes.

Q.—I want you to give an explanation other than what you gave?

A.—I have really no explanation to make.

Q.—I want you to give an explanation why, within seventeen months, an estimate went from 367 lakhs to 668 lakhs? It is a very considerable increase, is it not?

A.—It is a very considerable increase. I think I pointed out that 136 lakhs of that ought to be deducted on account of the equipment of the lay out, with which we had nothing to do.

Mr. Billimoria.—It was included in the original estimate.

A.—Excuse me, no.

Q.—Roads, lights, and drains?

A.—That was not the equipment of the area.

Q.—Then what is the equipment?

A.—The equipment of the area is the provision of sewerage throughout the area.

Q.—*Sir M. Visvesvaraya.*—Sewers are all included?

A.—Sewers are all included in the 700 lakhs estimate.

Q.—Sewers, storm water drains, and everything is included?

A.—Yes.

Q.—They are all included in the 702 lakhs?

A.—In 1922 the expert town planner produced a plan showing how he was going to lay out the area. Before that, no one had the slightest idea what they were going to do. There were talks of putting a Government House there. There were talks of putting recreation parks. Then they got this expert, Mr. Davidge, and he laid out the area, but before he had laid out the area nobody knew what they were going to do with the ground at all.

Q.—It is not necessary that a lay-out should be of any standard. We may have to assume something. You have assumed figures in your estimate?

A.—We did not assume anything for that.

Q.—Excluding that item, you might have been more correct in the other items?

A.—It was always understood that the sewerage would be done with the Municipal Committee.

Q.—*Mr. Billimoria.*—Roads, drains, and lighting are 75 lakhs. What would these indicate?

A.—A few main roads.

Q.—*Sir M. Visvesvaraya.*—To what do you attribute this considerable increase in the cost in seventeen months?

A.—I attribute it very largely to world conditions.

Q.—Is it not due to the omission of many necessary items in the estimate?

A.—No. I say generally that it was world conditions. I have really nothing to add to the statement that I put in.

Q.—Was Sir George Lloyd keen on the scheme?

A.—Very keen indeed.

Q.—Would you say he was very keen?

A.—Yes.

Q.—Do you recollect having stated at any time that he would like to see the sea wall grow in a night?

A.—I do not remember having made that statement, that he would like to see it grow in a night. I remember once jocosely saying to Sir George Lloyd that he must not think he was like Aladdin with the wonderful lamp, that he could go and rub the lamp and look out of Government House window and see the wall growing.

Q.—You went to the Government of India accompanied by the Secretary to the Government of Bombay in order to get the Government of India to agree to your scheme?

A.—Yes.

Q.—Writing on previous occasions to the Government of India had not helped them to obtain their consent to any reclamation scheme?

A.—No.

Q.—The Secretary of State remarked at one time that he felt embarrassed by the insistence with which questions connected with the reclamation scheme were being addressed to him?

A.—Yes.

Q.—You also now admit that work was done without a reliable estimate?

A.—Without what?

Q.—Without a reliable estimate?

A.—An Engineer's estimate.

Q.—And then the dredger was ordered even before the estimate was sanctioned?

A.—Yes. As I have explained, that was because Sir George Lloyd was so very anxious to begin the work in October, 1920, and he made arrangements for the

Government of Bombay with a firm of Contractors in Bombay, the Indian Construction Company, I think they were called, to begin the work. I do not know what the details are, but they cancelled the Contract, and the work was delayed for a year.

Q.—You say that you also wanted an order for the dredger to be placed before the detailed plans and estimates were prepared and approved?

A.—Yes.

Q.—We have got it here in the same note to which I drew your attention?

A.—Yes.

Q.—" With reference to the preparation of the necessary plans and specifications, the usual custom among Engineers is to accept the Contract, and a general specification, thereafter requiring the builders to submit for approval all detailed plans and specifications, and presumably this will be done in the present case; " you advocated that?

A.—Yes.

Q.—No tenders were in writing on a comparative basis for the dredger?

A.—For the dredger prices were got out; it was not advertised, if that is what you mean.

Q.—That is what I mean?

A.—It was not advertised.

Q.—It was not a competitive basis?

A.—It was not advertised.

Q.—You considered the scheme as being one of the greatest of reclamation schemes?

A.—Yes, I suppose it is.

Q.—Are not all these instances of undue haste in starting the scheme on the part of the Government?

A.—I can hardly call them undue haste. You heard what Lord Lloyd said in his evidence. Once he had got the sanction, his great idea was to get something——

Q.—To push on?

A.—To get something to show as soon as possible.

Q.—I ask this question because you have said in your statement that there was no undue haste?

A.—It is a question of what undue haste means.

Q.—I am mentioning these incidents. Is it not because all these things were done in a hurry that the dredger has not given satisfactory results?

A.—No, I would not say that at all.

Q.—You would not say that?

A.—No.

Q.—There are some other instances that I want to bring to your notice. Did you give the details of the 367 lakhs scheme which you have brought to-day to the Chief Engineer on the works?

A.—No, why should he have them?

Q.—Because without such details how could he lay-out the works, and commence? Did you not give him some details as to how you arrived at this figure of 367 lakhs; otherwise, how was he to proceed with the work?

A.—No, that was an ordinary preliminary Engineer's estimate. Then the Chief Engineer was appointed, and then he started preparing his working estimates which were sanctioned from time to time by the Director.

Q.—By the Development Director?.

A.—For instance, he started working the Khandivli Quarries, and he sent in a working estimate to the Director of Development, and that went up to the Government and was sanctioned. Then he sent up another estimate. All the estimates were sanctioned piece-meal.

Q.—Then in 1922, they prepared the 702 lakhs estimate, and they sent you a copy, I suppose, after sanction?

A.—They sent me a copy, yes.

Q.—Did your contract require that you were to prepare promptly working drawings, specifications, schedules of quantities and rates, and estimates of cost?

A.—Yes.

Q.—To what extent have you performed this part of your obligations. What working drawings have you prepared? You state that they prepared the 702 lakhs estimate themselves. You protested, of course?

A.—Yes.

Q.—I see that from the correspondence, but had you any occasion to revise that estimate and ask the Government to modify it as incorrect?

A.—No.

Q.—You accepted that estimate?

A.—We were not asked to accept it; we were simply given it.

Q.—You did not bring to the notice of the Government that this was part of your duty to prepare plans and estimates, and that the Director of Development went over your head?

A.—We did prepare a large number of plans, estimates and specifications.

Q.—Can you mention some that you have prepared?

A.—Yes. We prepared a complete detailed set of plans and estimates for the 8,000 feet of the Colaba wall which was going to be let on a contract.

Q.—What else?

A.—We prepared the plans and specifications for the Marine Line section.

Q.—The wall and gantry?

A.—Yes, that is about all the permanent work.

Q.—After all, the sea wall is simply a solid wall. How long would it take you to prepare that?

A.—I would not like to say how long it took to prepare it at all.

Q.—You should have done the detailed plans and estimates for all sorts of work?

A.—You mean, for instance, that we should have prepared the plans for the Khandivli Quarry?

Q.—Yes.

A.—That is an example.

Q.—You should have prepared plans. Plans and estimates have been prepared by the Engineers on the spot and sent to you for scrutiny and remark?

A.—The preparation of all those plans was particularly excluded from our agreement by the Honourable Member Sir Chimanlal Setalvad under an auxiliary contract.

Q.—You want stone for the permanent works. The sea wall is a permanent work, and all the stone for it has to come from this quarry?

A.—No.

Q.—How can you construct a sea wall without stone? The stone has to come from this quarry? The main purpose of this particular quarry was to supply stone for the sea wall.

A.—Supposing the wall had been let by contract? We should have prepared the plans of the permanent works, but we should not have dictated to the contractor the way in which he had to get his stone; neither should we have prepared any plans for the quarry.

Q.—But it was not a contract work. It was Departmental work, and everything connected with the sea wall should have been taken into consideration if you were responsible for the wall?

A.—No, because it was specifically stated under our agreement that we were not to be responsible for any of these works.

Q.—Mr. Lewis said there was very little done by you in respect of detailed plans and estimates?

A.—As far as the permanent works were concerned, we did what was necessary.

Q.—But what were the permanent works? They were only one sea wall. It was only a cross section of the wall with a mound; that was all. That would not take an engineer of your eminence more than a week to do. It is not a very difficult work to design a sea wall. You have so many examples before you, and you can take 10 or 20 sections from various other places?

A.—You find very similar works where there is even less to do.

Q.—What are the necessary important plans and specifications? What we noticed, when we inspected the works and also the offices, was the absence of details. The plans and estimates were in a rough state. They had collected a number of figures and called them estimates. There was no specification, no description, no detailed measurements.

A.—For what?

Q.—For any of these works. We did not see any detailed plans in the way that they are usually done by engineers, or by the Public Works Department.

A.—That is a question for the Chief Engineer. He got all his estimates sanctioned. Every estimate he prepared was sanctioned by Government.

Q.—Might it not be due to the fact that you were not supplying them with sufficient details: although you were able to do it, you did not take much interest in the work?

A.—No, because it was not within our province to supply details.

Q.—Your contract is very clear on that point: " Ensure complete and satisfactory supervision of the works "?

A.—Would you kindly refer to the supplemental contract?

Chairman.—You will find it at page 60—Supplemental Agreement of the 4th January, 1923.

Sir M. Visvesvaraya.—" Messrs Meik & Buchanan are the engineers for the reclamation and connected works only, and not for roads, drains, lighting, and other things necessary for the development of the reclaimed area." The development is entirely excluded, " but the cost of so much of the storm water drainage system as has to be constructed during the progress of the reclamation is to be included in the amount on which the percentage for the purposes of the firm's remuneration is calculated. This recommendation applies also to the East Colaba reclamation." That is all you have said, is it not?

A.—Yes.

Q.—That does not exclude anything, except development work. After the whole reclamation is completed then the development work is taken up, and they ask you not to have anything to do with that.

Chairman.—Look at page 62.

Sir M. Visvesvaraya.—I understand that the sea wall had been to a large extent completed by the 4th January, 1923? This agreement began on the 4th January, 1923?

A.—Yes.

Q.—So until then the works were going on smoothly?

A.—We always went on those lines, and that was the result.

Q.—The whole thing centres on this point. The preparation of detailed plans and estimate did not entail much labour on your side. You have given an excellent report at the beginning which, as far as I can see, Government took as being very satisfactory, complete and reliable. After that you have not prepared any estimates or plans worth mentioning? Of course the sea wall may have been an exception. I do not want to criticise you; I just want to get the facts.

A.—If you come into my office I can show you large rolls of papers. We prepared all the specifications for the machinery.

Q.—I hope you will not mind my asking you unpleasant questions, but it is necessary to do so in this case. When you ask for quotations for a plant, do not two or three firms supply you with the specifications themselves, without your asking for them? Is not that the usual practice?

A.—Detailed specifications, yes.

Q.—You scrutinise them and pass them. That is what you do generally.

A.—Yes.

Q.—You state in your report of September, 1919: " I have gone into the matter very thoroughly, and I believe my figures to be reasonable and reliable," and so on. Did your regard your estimate of 1919 at that date as approximate?

A.—It was the usual reliable engineer's estimate

Q.—Can you point out in your report, or in the letters addressed by the Government of Bombay to the Government of India, anything which shows that you regarded the estimate as approximate at that time?

A.—It depends on what you call an approximate estimate.

Q.—You have stated that the usual practice is to prepare an approximate estimate, and get administrative sanction, and then put in hand the preparation of detailed plans and estimates?

A.—Yes. It was not a detailed estimate. It was not an estimate that you would go and put before a contractor and ask him to tender upon.

Sir Frederick Hopkinson.—You do not put estimates before a contractor and ask him to tender on them. You give him quantities, not estimates.

A.—I beg your pardon.

Sir M. Visvesvaraya.—You say: " Under the rules of the Government of India for the carrying out of Public Works, the approval of my report, plans and estimates did not imply more than the accordance of administrative sanction to the scheme, and a detailed project estimate giving the fullest particulars under each head and sub-head should have been submitted before any actual expenditure was incurred." I am not aware that the Government of India do such things in regard to a large estimate like this. When they know that it is only an approximate estimate they do not give administrative sanction usually, do they?

A.—Yes, I think they do.

Q.—I know something of the practice of the Government of India; many years ago I was associated with the Bombay Public Works Secretariat for some time. You say: " As time was of importance it was decided to proceed in antitcipation of sanction, and to prepare the detailed project estimate as soon as reliable data had been collected." If your reliable data had not been collected at the time you submitted your estimate,

how could you call that estimate reasonable and reliable? I am asking you for an explanation?

A.—It was a reasonable and reliable estimate, sufficient to get administrative sanction. The dictionary meaning of the word " estimate " does not imply anything binding, does it?

Q.—No. These were figures deduced from experience of other works. You knew the cost of other works and you deduced from that figures for the new project?

A.—The new estimates for the new Delhi are very different from the old estimates.

Sir M. Visvesvaraya.—Extensions are ofter suggested when a work is in progress; one set wants certain things done and another set wants additions.

Chairman.—And another may want less.

Sir M. Visvesvaraya.—What I ask you is, if you did not think your data were reliable, how could your estimate be so? I am using your own words.

A.—Reliable as an estimate.

Q.—If you thought the estimate was approximate, why did not you give orders for surveys and collection of information and data immediately after the project was started?

A.—That was done by the Development Directorate as soon as they took over the work.

Q.—But you did not even advise them to do that. Have you any statement on record to show that you advised them that detailed plans and specifications should be proceeded with after your scheme was sanctioned?

A.—It was done as a matter of course. I did not think it needed any advice.

Q.—As a responsible engineer, was it not part of your duty to remind them?

A.—It went on as a matter of course.

Q.—They took more than two years to prepare plans and estimates?

A.—But they were preparing, all the time, minor estimates and getting them sanctioned. They were getting sanctioned minor estimates every week.

Q.—Detailed estimates?

A.—Yes, for one item after the other.

Q.—Is it not very necessary, in the case of an important work like this, that some special staff should be employed, and all detailed plans and estimates worked up in three or four months' time? After all, although this reclamation scheme looks very big in money, it consists only of a wall and earth filling—two items. The dredger is a specialist's work, but you had only those two items to prepare estimates for. Why could not a detailed estimate be completed in about three months' time? In another place you mention that the preparation of the estimate would have taken a staff of engineers at least one year, and that it was decided to proceed in anticipation of sanction. Why should it take one year? Could not an engineer, with two or three assistants, have prepared it in about three months' time?

A.—I think you would have found that the staff would have taken about a year.

Q.—You prepared the section of the sea wall. The rest was all earth filling. It seems to be a very simple work. An architect for a building would require so many of these plans, but in this case there are no engineering difficulties of construction or design?

A.—They would have had to have got out all the details of the 700 lakh estimate. That would have taken about a year to do.

Q.—You think it would have taken a year to do it?

A.—I think so, yes.

Sir Frederick Hopkinson.—May I interrupt for a moment? How long would you give a contractor to make up an estimate for that work?

A.—I do not know at all.

Q.—Would it not be more like six weeks?

A.—Not if they are doing it as agents for the Government of India.

Q.—Supposing you had decided to ask for tenders for the work, how long would you have given the contractor to make up the estimate?

A.—I could not make any comparison between a contractor and a Government.

Q.—Supposing you had decided to do work by a contractor, and you asked a contractor to tender for it? You would ask him, say, on the 1st January. When would you tell him by when his tender would have to be in?

A.—I do not know.

Q.—Does not a contractor get about six weeks for a large tender?

A.—Six weeks to three months; but that is not Government doing it. Government would take a great deal longer.

Chairman.—The question was a contractor.

A.—A contractor would take six weeks to three months.

Q.—You must put forward many of these documents, both by advertising to the world at large, and individually to contractors. The question is whether you would not have required the tenders to be in about six weeks' time?

A.—Yes, certainly I should—six weeks to three months.

Sir M. Visvesvaraya.—Why, in this case, would it take a year, particularly as you are taking the risk of proceeding with the work on imperfect data?

A.—Because I think a Government Department, which works quite differently from a contractor, would have taken about a year.

Q.—I am afraid you have a very peculiar idea of Government Departments. It only means bringing a number of people together and asking them to fix a time?

A.—They have no incentive.

Sir M. Visvesvaraya.—But they have a sense of duty. They have to get into the favour of Government and to keep up their reputation. Is not that an incentive?

Sir Frederick Hopkinson.—The real point is that if you ask a man on 1st January to send a tender in on 1st December, he would say: "What month am I to base my prices on?" Prices may vary enormously.

Sir M. Visvesvaraya.—There are people, even in Bombay, who could give you an estimate for work of this kind in about two months' time. Now I come to a very important question. You know that the idea of a suction dredger was introduced for the first time about the year 1905?

A.—I accept that.

Q.—Before that they were thinking of reclaiming by dry filling?

A.—Yes.

Q.—When you prepared your estimate in 1919, did you consider what the alternative cost would be if dry filling were adopted?

A.—No. I never had any doubt as to what was the cheapest method.

Q.—Do you still think that?

A.—I do, and Mr. Kidd says the same in his evidence.

Sir M. Visvesvaraya.—I do not know; he cannot mean exactly what you mean.

Chairman.—He says that reclamation over a large extent is cheaper—he means by a suction dredger—than any other method.

Sir M. Visvesvaraya.—He had in his mind a different kind of dredger to what you have designed.

A.—That is a matter of his opinion.

Q.—There is a total quantity of 28 million cubic yards. What would you put the cost at for a cubic yard by dry filling?

A.—I have not gone into it.

Q.—We have had a cablegram recently from Bombay in which they say it is possible to do it for Rs.1, 8 annas. We consider it might be done for even less, but taking it at Rs. 1, 8 annas, for 28 million cubic yards, the cost would be 420 lakhs, would it not?

A.—Yes.

Q.—If the work is properly organised you may be able to do it for less than that. You have to add to that the sea wall, about 160 lakhs, making 580 lakhs. If the 367 lakhs estimate originally were a satisfactory estimate as compared with moorum filling, you could have done the work by earth filling for less than 702 lakhs?

A.—We never went into the question of dry filling.

Q.—Was not that a serious omission? Nobody would have sanctioned an estimate for 702 lakhs without giving consideration to this aspect of the question? When you prepare an estimate you have to show that your estimate, compared with all other alternative estimates, is the cheapest or most reasonable. If that had been done, Government would have found when they were faced with a 702 lakhs estimate that there was a cheaper method of construction than that designed by you. Is that not so?

A.—They did not do it, and they prepared the 702 lakh estimate.

Q.—But where does your expert advice come in, if you did not advise them that compared with a 702 lakhs estimate dry filling was cheaper? Do you not think that the alternative method should have been put forward to Government when you sent in your proposal?

A.—No. There never was any question about dry filling. Dry filling was always considered as outside the question.

Q.—Why outside? Until 1905 that was the only method of construction contemplated? Why should it be outside your purview or your consideration? Is it not desirable to prepare alternative estimates and select the one most economical and efficient?

A.—Well, it never was considered.

Q.—Turning to your terms of reference you say, " The specific point on which my opinion is required is the suitability of the proposed method of reclamation by means of dredging or alternative proposals for same." That is specifically mentioned on the first page of your report. Why did you not put forward other alternative proposals for the consideration of Government?

A.—I did not think there were any alternatives then.

Q.—There was nothing to think about if you had gone into the terms of reference put forward?

A.—Any estimates at that time would certainly have shown that the cost of dry filling was vastly in excess of wet filling

Q.—As an engineer, do you now recognise that earth filling was a cheaper method than dredging under present conditions? The dredger and the dredging would together cost 460 lakhs. The dredging plant is 162·48 lakhs; laying shore line pipe 1·76 lakhs and dredged filling 310 lakhs, according to the latest estimate. The whole thing comes to 470·47 lakhs, or 4¾ crores. Do you now recognise that dry filling would have been cheaper?

A.—No, I have no information about the price of dry filling.

Q.—It is a very simple problem

A.—How long would it take?

Q.—It would take much quicker than you could do it with the dredger. The dredger would do about 2 million cubic yards per annum, and they will be able to do twelve thousand cubic yards per day, which means about 4½ million cubic yards per annum. If that is so, would you agree that dry filling would be cheaper than the dredging which is now going on?

A.—I would not like to express an opinion. It would take a long time to think it over.

Q.—The figures are very clear.

A.—If you say you can do it cheaper, I accept what you say.

Q.—That is all I want. Several engineers, including Sir Alexander Gibb, Mr. Neilson and others, have said that if you have regard to the character of the material met with in the harbour it is not a dredging proposition at all. As a dredging proposition an estimate of 367 lakhs is quite alright, but when it comes to 702 lakhs, there is a cheaper method than dredging. Some people consider that this is a serious omission in estimating. They also say that you took no active steps to prepare a detailed estimate the moment the work was begun. It was left to chance. The work was begun and it dragged on, and in two years the detailed estimate was prepared. In the meantime work was going on and expenditure being incurred at the will of the subordinate officers which was all wrong.

A.—Estimates were being prepared.

Q.—You also said, in the case of Mr. Kidd's report, " It is usual when preparing estimates for a project of this magnitude, and especially when the estimates are those on which the authorities are asked to sanction the execution of the work, for all details to be furnished, but in this case details are left to imagination." In the case of your estimate also the details were left to the imagination.

A.—Mr. Kidd's was a working estimate and mine was an engineer's estimate. Mr. Kidd's was an estimate accompanied by ten sheets of working drawings, and it was an estimate sent up for final sanction.

Q.—That may be, but you led Government to infer that your estimate was reliable and reasonable, and you did not make any qualification such as you are now putting forward. In the statement you have furnished us with you have stated it is just an engineer's estimate, and you qualify it in a number of ways now; but you have never said a word in your report, nor did Government understand it so. Can you tell us why that is so? You now give an explanation in your statement here. In your report of the 11th February, 1922, to the Development Directorate you say, " Under the rules of the Government of India for the carrying out of public works the approval of my report, plans and estimates did not imply more than the accordance of administrative sanction to the scheme." What are the rules to which you refer? Can you point to any rules of that sort?

A.—No, I cannot.

Q.—There are no rules of that sort. They do not give administrative sanction so easily as you assume. The previous history of these same works shows that they have turned down scheme after scheme and have never sanctioned one, until you induced them to sanction one " and the detailed project estimate giving the fullest particulars under each head and sub-head should have been submitted before any actual expenditure was incurred." The actual expenditure was incurred in your case before any detailed project

was prepared. How, in the face of so many irregularities, do you think a work of this kind could succeed?

A.—I do not admit there were any irregularities.

Q.—Omissions I will put it. Were regular tenders called for the dredgers? If so, can you show us a copy of the notice issued by you?

A.—I have given you all the information I can.

Q.—Were the tenders compared and reported on?

A.—I have nothing to add to what I have already said on the subject.

Q.—Will you answer me yes or no—whichever you think proper. If you refer to some previous explanation, it will not help me. I want to be able to follow you. If you say, "I cannot give you an answer," do so.

A.—What is the question?

Q.—I want to know if you have a copy of the notice issued by you inviting the tenders?

A.—Yes.

Sir M. Visvesvaraya.—Will you kindly show it to me?

Chairman.—We have it. We have all the correspondence.

Sir Frederick Hopkinson.—You mean for the dredgers? They asked the dredger builders to come up to London to see the plans in the London Office and certain information was given to them.

Sir M. Visvesvaraya.—Can you give us a copy of the notice issued by you? You say it is available.

Sir Frederick Hopkinson.—We have it.

Sir M. Visvesvaraya.—Messrs. Lobnitz never got any notice.

Sir Frederick Hopkinson.—They were written to by Messrs. Meik & Buchanan in London, and were asked to come up to London to see the plans.

Sir M. Visvesvaraya.—But that is not a notice.

Chairman.—Sir George Buchanan and you are not quite at one about it. Sir George does not suggest—at least I am sure if he has suggested it he will withdraw it—that his firm ever sent a written notice giving details. What they in fact did was to write a letter saying, "We have been instructed to ask for one or two offers" (&c., reading letter down to the words "when we can explain the matter").

Sir M. Visvesvaraya.—I want to know whether the usual notice was sent inviting tenders. It was not published and issued it is true, but was it issued individually to each contractor?

A.—Yes.

Q.—Will you kindly show it to us?

A.—Notice was sent to each of the firms mentioned.

Chairman.—All the four firms had a letter to that effect—asking them to send a representative. We have three of them here, and I think Mr. McMurray told us he also got a letter.

Sir M. Visvesvaraya: In the case of Mr. McMurray you had had a long correspondence beforehand about the 367 lakh estimate, so it is quite all right so far as they are concerned; they knew all that you wanted. The other dredger builders, however, had no notice, and you asked them to come to your office, without giving them any particulars in writing?

A.—Each firm had sent them a large plan showing every possible particular of the ground and the dredging and everything wanted.

Q.—There is no mention of anything in the correspondence?

A.—I can show you the plan if you like.

Sir Frederick Hopkinson.—I should very much like to see it.

Sir M. Visvesvaraya.—I am sorry to ask you unpleasant questions, but why was it necessary to make a secret thing of it at all?

A.—Because we are not in the habit of disclosing the results of tenders we receive publicly. There is nothing to conceal.

Q.—The whole thing totalled together cost £500,000. Was not publicity necessary? It was Government business. Was not publicity necessary in regard to the conditions on which you invited tenders?

A.—It was the usual method, which we always adopt.

Q.—In your case you were acting for the Government. You were not doing it on your own account?

A.—We followed our usual procedure.

Q.—You did not compare the tenders and discuss them, and report to the Government your recommendation, with reasons for approving Messrs. Simon's tender?
A.—That was done by my office here when I was in India.

Q.—Was a proper memorandum prepared reviewing all the tenders, and stating why you particularly recommended Simons?
A.—Yes.

Q.—Could you kindly show it to us?
A.—I will see if I can find it.

Q.—We have a casual note about your recommending Messrs. Simons' tender for the dredger, and nothing more. It is on a quarter of a sheet of foolscap.
A.—Yes.

Q.—How could you have secured an efficient design without inviting competition? Simons are well-known builders, it is true; but why depend upon one firm only when other firms might put forward proposals and bring you their experience?
A.—We followed our usual procedure that we have adopted for years.

Q.—But this is an unusually big tender; an unusually big proposition.
A.—Well, we did what we always do. We do not advertise everything, and we were not in the habit of doing so.

Q.—Before you recommended one tender did you prepare a properly reasoned memorandum to submit to the Government for their sanction or information; or rather, was it not desirable that you should have prepared a memorandum and placed it before the Government?
A.—I think a complete memorandum was placed before the Government?

Q.—Have you a copy of it?
A.—No; I do not remember it. It is so long ago.

Q.—What we heard in Bombay was that you made a note on the margin of a document indicating your approval of Messrs. Simons' tender, and then the Bombay Government wrote to the Secretary of State and that was approved on your recommendation?
A.—Yes.

Q.—There was no memorandum or complete note dealing with the reasons which induced you to recommend Simons' tender.
A.—Well, there should be. There must be one somewhere.

Q.—If you did not send out full particulars and outline the proposals to the firms, how were they to know what was required? Do you think they will regard you to be serious about it?
A.—Yes; I think so.

Q.—Before you recommended Simons' tender you did not see the other tender of Lobnitz? They had merely telegraphed the cost?
A.—Yes, something of that kind.

Q.—They suggested two dredgers?
A.—Yes.

Q.—Was that sufficient information for you to come to a decision upon?
A.—It was ample information for me because the person in charge was my late partner, Mr. Charles Meik, one of the most capable engineers in Westminster. It was all done by him, and I had perfect confidence when I got the telegram as to what his opinion was.

Q.—You may have had perfect confidence yourself but should you not satisfy the public and the Government, according to the usual standards followed in such cases, when you invited tenders from a number of builders, namely, that they were all examined, costs compared, advantages and disadvantages weighed and efficiency discussed, before you made your recommendation? Nothing of that kind seems to have been done. You got information by cable, and one or two people declined to tender because the information supplied was slender. Then you made up your mind to give the tender to Messrs. Simons & Company.
A.—No, we took what we thought was the best.

Q.—The Chairman has already drawn your attention to paragraph 6 of your report, which runs thus: " The Government are well aware that economy in this class of work can be obtained only by securing that the suction dredgers and other plant required shall be of the best design. The difficulties which have arisen with the Port Trust dredgers serve as a warning on this point." You do not seem to have taken warning yourself?
A.—I have nothing to add to what I have already said.

Q.—I am only quoting your own statement.

A.—If I may say so, I cannot go on repeating myself. I have already explained fully my opinion on this matter, and I cannot say anything more.

Q.—You also admit that you advised the placing of the contract before the details were prepared here.

A.—I advised the placing of which contract? Do you mean before the details of the whole work were prepared?

Q.—You say that the first thing necessary is to place the contract and submit for approval all the details of the plans and specifications afterwards. You say that on page 2 of the note which you gave to the Director General of Stores. Coming to the question of soft clay and hard clay; you have already given an explanation in answer to the questions put by the Chairman. If a dredger could deal successfully with hard clay, it can also deal with soft clay, but not vice versa.

A.—I beg your pardon.

Q.—If a dredger could deal with hard clay, then it can also deal with soft clay?

A.—Yes.

Q.—But not vice versa?

A.—No, certainly it can deal with hard clay, only not in such great quantities.

Q.—You have used the words " hard clay " also in several places. You recognised the existence of hard clay?

A.—Yes.

Q.—But you have not used it in the dredger specification. What is the reason? I am sorry to ask you these questions, but I have to do it.

A.—The specification says soft clay.

Q.—But you have referred to hard clay in several parts of your report. In the 1919 report, and also in your early reports, you mention it in places, which shows you were aware there was hard clay.

A.—I have explained that fully in my evidence. The hard clay refers to the bottom layer.

Chairman.—That is not quite it. Your other explanation is that in speaking of hard clay you meant, not with reference to its position in the harbour, but with reference to it as a substance of reclamation?

A.—Yes; that is so.

Q.—I want you to be correct about it.

A.—Yes. I have said so much about clay that I do not want to repeat it.

Sir M. Visvesvaraya.—What puzzles me is this. You mentioned hard clay in your reports, and you do not bring it forward in the specification.

A.—I think I can only say in my judgment the dredger is correctly designed to work in soft clay.

Q.—You maintain that still?

A.—I maintain that absolutely.

Q.—You are opposed to the use of the term " hard " for the description of the material?

A.—I am.

Q.—Why have you used it yourself on page 9 of your report?

A.—I have explained I have used it in reference to the hardening out.

Q.—Then on page 12 in the printed compilation of correspondence you have stated this, and it is in your own name, not in the name of your firm : " I may say that we do not accept without more information Mr. Mitchell's pessimistic view of the nature of the material we shall get from the harbour, as we hope that there will be a great deal of hard clay which will require very little moorum backing." There you use the words " hard clay."

A.—Yes.

Q.—If hard clay was specified, then it would include soft clay, but not vice versa; so that you have precluded hard clay from the terms of the specification?

A.—I really cannot say anything more than I have said.

Q.—As regards the output of 5,000,000 cubic yards per annum, there are no guarantees from the dredger-builders, and we do not see any description of any other dredgers which have given that output. Did you think that your dredger would give the output that you have specified? What considerations made you think if you ordered the dredger on these lines you would get the output that you specified? Were you not particular about getting output at all?

A.—No.

Q.—You were anxious, or you were fairly sure, that the dredger would give the specified output?

A.—Yes.

Q.—You still think it could do that?

A.—Yes.

Q.—That is your position?

A.—Yes.

Q.—Very few people who have seen the dredger in Bombay agree with you.

A.—I am not surprised at that.

Q.—If hard clay is clay which would dry up hard, would soft clay dry soft? When it dries up will it be soft, and in that case will it be useful for reclamation purposes?

A.—Yes; but it would not dry soft, it would dry hard.

Q.—Soft clay would dry hard?

A.—Yes. Hard and soft are merely to be used in relativity. You can have soft steel.

Q.—That is true. The interpretation you have put is very unusual, I think, from a business point of view. I do not think many people would share with you that interpretation. Why did you not provide for a guarantee in the specification for testing the dredger at the site?

A.—I have never done such a thing in my life, and I do not know any place where it has ever been done.

Q.—If you did not do it in your life, ought not you to take a leaf from the lives of other people and inquire whether other engineers did it?

A.—They do not do it.

Q.—Then people take a very serious risk in entrusting work to you. Do you not take the experience of builders of other dredgers in all parts of the world before you design?

A.—I do not know of any place in the world where they have given a test at the place of delivery. I am not acquainted with any case in the world where a dredger has been sent 8,000 miles and the builders have given a guarantee at the place of delivery, except I am told there was some sort of guarantee for the "Jinga" and "Kalu." There may be cases, but personally I do not know a similar case.

Sir M. Visvesvaraya.—In the case of the "Kalu" there was a specific guarantee, and the dredger was supplied by the same builders.

Chairman.—It is agreed that both were to do either 78 or 80 hours trial, and by some magic both vessels did in fact do over 2,000 cubic yards per hour. After they passed out of the hands of Messrs. Simons they dropped down to 555 and the other figure of 1154.

A.—Exactly.

Chairman.—It is an average of 1126.

Sir Frederick Hopkinson.—The important thing is whether it is a maximum or average output; that is the whole point.

Sir M. Visvesvaraya.—You have to get an average of 2,000 cubic yards an hour to get your 5,000,000 cubic yards per annum?

A.—Yes.

Q.—This did nothing like the average.

A.—You have not started working yet.

Q.—Three years have elapsed. If it has not started working properly, why did not you call the attention of the Government to the delay?

A.—We could not call it three continuous years, but three dredging seasons.

Q.—You have declared that the whole thing should be completed in six years?

A.—Yes.

Q.—By now you ought to have got 15,000,000 cubic yards, but the dredger has not done more than 3,000,000 cubic yards.

A.—I have nothing to add to what I have said.

Q.—15,000,000 cubic yards is what you promised, and till now they have got 3,000,000 cubic yards?

A.—Yes.

Q.—You said for a little higher price it would be safer to get a dredger which would do this job on the site?

A.—I say this dredger will do its job.

Q.—Your mere estimate cannot be satisfactory. What is the guarantee? For three years you have been working it, with this unsatisfactory result. You are the technical adviser; why did not you take charge of it yourself?

A.—I do not handle dredgers.

Q.—Then why did you recommend it? You say you know all about dredgers in this statement. Your statement is very specific on that: " We are better acquainted than anyone else with the work to be done." Therefore if anything goes wrong with the dredger you have designed, you can go to the Simons' people or to the best experts and take their advice and prove that that dredger could do what was promised. The Government of Bombay would even now be prepared to give facilities if you can do it in three months' time. At all events I do not think they would object to such a proposal.

A.—If the Government likes to make a proposal I should be glad to consider it.

Q.—You would consider it?

A.—Yes. If the Government makes a proposal I should be very glad to consider it.

Q.—That is a specific statement, but you must not prolong the work. You must not require three or four years for trials?

A.—No.

Q.—Why did not you keep a representative of your own to watch your interests on the spot, and to keep you informed? The chief engineer was not giving you the information you wanted. As the engineers responsible for the work, why did not you have a man there to report to you and keep you informed of what was going on, so that you could take action according to the terms of your contract if they failed to do what you liked?

A.—We should very much indeed liked to have one there, but the Government of Bombay would not pay for him.

Q.—On the terms of your contract was not that included in the fee paid to you?

A.—No. Under the terms of my contract all the staff in Bombay were to be paid by the Government of Bombay.

Q.—But the expenses of your staff are your own concern?

A.—Yes.

Q.—Then should not you have kept a man there to enable you to carry out the terms of the contract?

A.—The Resident Engineer was supposed to be our representative.

Q.—He was the Chief Engineer?

A.—Yes, he held the dual office of Chief Engineer and Resident Engineer.

Q.—That did not work well?

A.—It was suggested we had better have an independent representative, and we said, " We should like it very much indeed, but you have got to pay him. It is no part of our guarantee to pay him."

Q.—Then about the guarantee at site: I understand that at Aberdeen there are dredgers which have been tested at site. You have no knowledge of that?

A.—I have no knowledge at all.

Q.—Were you aware that in the case of the " Kalu " and the " Jinga " the same firm had given a guarantee for a test at site?

A.—Yes, I understood they had.

Q.—Did you know it when you placed the order?

A.—I think I did, but I did not attach any importance to it.

Q.—Have you got your calculations for the capacity of the dredger, the horse-power to be specified, and all that? Have you got the details?

A.—Sir John Biles has that information; it is in the specification. The specification was drawn up by Sir John Biles.

Q.—Did you satisfy yourself that the horse-power designed was sufficient to enable the dredger to operate properly and give you the promised output?

A.—Yes.

Q.—What are the grounds on which you have come to that conclusion? Have you made any calculations, or have you had before your mind's eye examples of other dredgers which have given a similar output?

A.—I really could not answer that; I do not remember that.

Q.—It is a very big proposition, and you have taken the responsibility for it. Do you not think there must be some reasons in your mind before you recommend with so much confidence that the dredger would do its job?

A.—Well, I cannot say anything more.

Q.—You had the example at Bombay itself of a dredger on which guarantees had been obtained. You did not care to take that in account?
A.—No.

Q.—There were practically no tests under normal working conditions?
A.—Well, the tests were conducted by Sir John Biles.

Q.—When he was asked why the specification was in that particular form, and why guarantees were omitted, he said : " It is not my business, you must ask Sir George Buchanan.
A.—Yes.

Q.—Whom should the Government now hold responsible? The thing has gone wrong; that much is certain. Your present attitude is that you think you could put it right?
A.—I have no suggestion to make, except what I have already said : " Sack the lot."

Q.—You have specified for 5,000,000 cubic yards of output per annum, or something close to that. You should either give proper calculations to prove that or you should say that some other dredgers are doing similar work and this should do the same. Have you either of those methods of proving it?
A.—We went into the matter very carefully in the office. I have nothing more to say about it.

Q.—Then the Government had to take their chance by leaving this matter in your hands?
A.—Yes, they have to take the chance.

Q.—Then Mr. McMurray had stated that he was asked by you to agree to a guaranteed output at site, but he would not consent. Was he stating an untruth when he said that?
A.—No, he was not stating an untruth. I may have just mentioned the matter, but I never pressed it; it was not the sort of question I pressed.

Q.—You did not ask the other tenderers for similar guarantees?
A.—No.

Q.—Did you make any tests on the spot before you came to the conclusion that these specifications were the correct ones? Did you make any test on the spot in Bombay?
A.—No.

Q.—I suppose you made a calculation that the output would be 5,000,000 cubic yards per annum?
A.—Yes; that is what we asked for.

Q.—Having regard to the limited time available, 170 days, I understand you are going to give me to-morrow some instances of other dredgers which have given 2,000 cubic yards per hour?
A.—I have no information on the subject.

Q.—A dredger working for 170 days, which is likely to produce 5,000,000 cubic yards—is there anything near that in the case of any other dredger?
A.—It would take me months to look it up. I have no information on the matter.

Q.—Then must not the inference be that the design has been prepared without giving much thought to all these details, if you have not already got it?
A.—No.

Q.—If you can furnish that information within a few days I should be much obliged. It is difficult, I recognise, but you must have gone on some basis and some past experience, or on some calculation, before you decided that this dredger would do this amount of work : every engineer does that?
A.—We go to the maker, and ask the maker to produce a dredger to do a certain amount, and the maker produces it.

Q.—Then you did not get any guarantee from any particular maker?
A.—No.

Q.—If they had been asked to give a guarantee perhaps they would not have done it?
A.—No.

Q.—What is the good of specifying a capacity if no guarantee is taken for the efficient working of the dredger and if no penalties are enforced in the case of failure? In all contracts there is usually a penalty clause. This is one of the biggest propositions in the world. Should not these ordinary guarantees have been secured?
A.—No.

Q.—Sir John Biles stated he was entirely guided by you. He said the specifications were yours and you have accepted the entire responsibility in various statements. Who prepared the specifications for the dredger : was it the dredger builders?

A.—They prepared the detailed plans of the dredger.

Q.—That is the usual thing?

A.—Yes.

Q.—What part of it was provided by Sir John Biles?

A.—He revised the thing, he practically redrafted the whole specification.

Q.—On the materials supplied by him and by you?

A.—Yes.

Q.—Who is responsible for the output of the dredger at present—the people on the spot?

A.—The people on the spot.

Q.—When the dredger in the first year failed to give the promised output did you call upon the builders in the usual way : " Now why is not the dredger doing its job : what improvements are necessary? Will you put it right? If under the contract you are not bound to put it right you may charge a special fee for doing the work. Can you tell us what is wrong." Did you address a direct letter to that effect?

A.—It was nothing to do with the builders of the dredger; the dredger had been passed. It had passed the guarantees on the Clyde; it was no responsibility of the builders of the dredger.

Q.—If it did not give the output stipulated?

A.—If it does not come to its output.

Q.—But they have a moral responsibility, have they not? It is a huge business. They had accepted a specification for 5,000,000 cubic yards a year output. I suppose they meant to give a serviceable article when they undertook the contract?

A.—Yes.

Q.—Have they not a moral responsibility to put it right? They may charge a fee for it, but they are bound to do that, are they not? Who is responsible? You give the order and hand it over, and it is tested on the Clyde, and the dredger goes out there. You say you are not responsible, and Sir John Biles says : " I simply wrote down the specification on what was required, and handed it over to the builders." You say the builders are not responsible—then who is responsible? Somebody must be responsible. The Government trusted you and trusted Sir John Biles, that you would design and give them a serviceable dredger. But have they not a moral responsibility?

A.—I do not know about a moral responsibility.

Q.—If they disclaim responsibility, does it not show they have no confidence in the design?

A.—No.

Q.—I do not think the Government would refuse to pay a fee to put things right, or make some additional payment if necessary.

A.—Suppose the builders say there is nothing to be put right?

Chairman.—The dredger builders say so; they say : Our dredger will do exactly what it was promised to do.

A.—5,000,000 cubic yards.

Chairman.—In soft clay.

Sir Frederick Hopkinson.—They said at the rate of 2,000 cubic yards an hour.

Chairman.—Yes, in soft clay; and they say " That was the limit of our obligation, and we have done it. If you wanted something else you should have asked for it."

Sir M. Visvesvaraya.—Sir George has, in his description, stated that 5,000,000 cubic yards ought to be the output per annum.

Sir Frederick Hopkinson.—There is a great difference between 2,000 yards in one hour and an average of 2,000 yards through the whole season.

Sir M. Visvesvaraya.—I am asking the same question.

Sir Frederick Hopkinson.—The builders may floor you with a question of one hour's work, but all the calculations out there are based on 2,000 yards an hour average work for the whole season—which is a very different thing.

Sir M. Visvesvaraya.—Are not the persons working the dredger now supplied by the builders themselves?

A.—No.

Q.—Mr. Brims is a builders' man, is he not?

A.—No.

Q.—Mr. Speirs was a builders' man?
A.—Yes.

Chairman.—Mr. Speirs was nominated by the dredger-builders and approved by Sir George.

Sir M. Visvesvaraya.—I understand several of the subordinates were supplied?
A.—They may have worked for them.

Sir Frederick Hopkinson.—They may have worked for them, but they are not actually responsible for them.

Sir M. Visvesvaraya.—Would they be prepared to come forward and prove the working themselves?
A.—If they were paid for it, yes.

Chairman.—Wait a moment. Do you know that they would, or would not they sit on their contract and say: "We have done what we promised to do, and we have got paid for it"? Are you in a position to pledge Messrs. Simons that they will go out to Bombay and make that dredger do 2,000 cubic yards per hour in Bombay Harbour? They have steadily refused to do it, you know.
A.—I do not say they would pledge themselves to any guarantee, but I thought the question was: Would they go out and do something?

Q.—Had not you better leave them to give an answer to that? That is all I mean.
A.—Yes.

Q.—We do not want to create a wrong impression.
A.—Then I had better not answer.

Sir M. Visvesvaraya.—Why was no direct question of that nature put to the builders when the dredger failed to give the required output for two seasons? Why were they not called upon to make good?
A.—Excuse me. You have asked that question before, I think. We are going round and round.

Q.—You have not taken any action on the Government letter?
A.—No.

Q.—You did not call upon them to say why the dredger is not performing properly, according to specification?
A.—No; I have already answered that question.

Q.—I suggest a direct question should have been put by the engineers to the builders. You have already answered that question, you say; but I want to know what is the correct position. Should not the engineers have called upon the builders to explain why it is not giving the required output?
A.—No; I do not think it was any of their duty.

Q.—You now say that you can prove that it will do 5,000.000 cubic yards, but you were there the first season, and the second season, and I think, the third season; but nothing was done. You did not then say that you could put things right if the matter was left in your hands. Did you call upon the builders in a direct manner and say: "Your dredger is not giving the proper output"?
A.—No.

Q.—"Will you put on your own men and prove it, or words to that effect"—did you ask them that or not?
A.—No; with all deference, I have already answered these questions.

Q.—Did you advise the adoption of three shifts on the dredger?
A.—We always expected the dredger to work 24 hours a day. Those were Mr. Brims' instructions.

Q.—I thought your instructions were 15 pumping hours?
A.—That means working 24 hours a day.

Q.—15 hours is the average for pumping?
A.—Yes.

Q.—Your contract says that Sir George Buchanan shall devote the greater part of his time to this particular work. Could you kindly tell us the number of days you spent at Bombay on this work?
A.—I have put in a complete record of it.

Q.—I want to know how many days you spent in Bombay during each of the five years you were responsible for the work?

A.—I have already put in a statement to that effect.

Sir M. Visvesvaraya.—That does not give the number of days.

Mr. Ewbank.—No, it does not; but I can work them out.

Sir M. Visvesvaraya.—I wish you would do that.

Mr. Billimoria.—The witness said several months.

Sir M. Visvesvaraya.—The terms of the contract run thus: During the whole period of the execution of the works, the works shall be closely supervised, and Sir George Buchanan shall devote the greater part of his time to this particular work. Have you devoted the greater part of your time to this particular work?

A.—I suppose I have. I do not think I have ever been accused of doing anything else.

Q.—Then it says: " And shall remain in Bombay during such period during the working season as he or the Government of Bombay think necessary to ensure the complete satisfactory supervision of the works." We have already seen that in the way of detailed plans and estimates little was done. In this matter of devoting time, you spent only a few days in Bombay each season. Did you spend several months in the winter in Bombay, which was the understanding, according to your statement?

A.—No; in my agreement.

Q.—No; what you said to Mr. Montagu.

A.—Would you kindly look at the agreement? I go by the agreement.

Q.—The agreement is: " Shall devote the greater part of his time to this particular work, and shall be present in every year, and shall remain in Bombay during such period during the working season as he or the Government of Bombay think necessary to ensure the complete and satisfactory supervision of the work." Here is the statement you have made yourself: " I had agreed to go out and spend several months every winter in Bombay." How many months have you spent in those five years?

A.—I am prepared to go by the agreement.

Q.—The agreement is based on an understanding.

A.—That is not my agreement.

Q.—" The following is an extract from a memorandum of my interview with Mr. Montagu." When you wanted the contract to be entered into you promised that you proposed to spend several months every winter in Bombay?

A.—Yes.

Q.—You have not fulfilled that promise, have you?

A.—I can only repeat that I go by my agreement.

Q.—Then when you wanted the contract they gave it you on that understanding. You gave a promise on your own statement that you would spend several months in Bombay each winter, and you have not spent anything like that?

A.—I consider I have fulfilled absolutely my agreement. I have remained in Bombay every year as long as ever the Government required. I have never been asked to stay a day longer that I stayed.

Q.—That may be because they thought you did not take sufficient interest in the work, or you did not give them detailed plans and estimates. It may be due to that. The several months that you promised to be there you have not spent there.

A.—I do not agree.

Chairman.—We must make this quite clear. Your view of the agreement is that your obligation was not an obligation that it was necessary to stay for months. It was for you to stay there as long as you thought it was fit for you to do so, and also the Government of India should retain you as long as they wanted?

A.—That is correct.

Q.—When those conditions were fulfilled, that you had been there long enough to have supervised all the work, and when the local Government said: " Everything is all right," you were at liberty to go?

A.—Yes.

Q.—It might have been 170 days, or it might have been 20 days?

A.—Yes. If the Government had ever asked me to stay any longer I should have stayed. When the Government asked me on one occasion to go out specially in the monsoon I obeyed their orders.

Sir Frederick Hopkinson.—You must exclude the year 1925 from that. You could not have returned in the year 1925?

A.—No.

Sir M. Visvesvaraya.—In the contract or in the correspondence the work to be done in England is: "Correspondence with the Government of Bombay or any officer deputed to act on their behalf, including any reports from time to time required by the Government in respect of dredging plant or material, or progress of the works." Have you furnished any reports in respect of the dredger plant to the Government of Bombay. I suppose you take your stand on the point that you think the dredger can be made to work and give the output. What work had you to do in connection with the final inspection and supervision of the tests and trials of the dredger?

A.—I was in India.

Q.—You were in India then?

A.—Yes.

Q.—So the final tests were made without you?

A.—Yes; without me.

Q.—Did you make any tests yourself on its arrival in Bombay?

A.—No.

Q.—What was the work in connection with the design or specifications of the dredgers that you particularly did?

A.—I did not do any at all. It was Sir John Biles who did it all.

Q.—And the dredger-builders supplied the original specifications. You have got them printed in your report.

A.—They supplied those, yes.

Q.—Sir John Biles modified it, and then issued it to the dredger-builders?

A.—Yes.

Q.—What was your share of the work in that connection?

A.—After Sir John Biles had done that?

Q.—In connection with the whole design and specification of the dredgers.

A.—We supplied the general particulars.

Q.—You have not devoted the greater part of your time to this work?

A.—I beg your pardon.

Q.—You have not devoted the greater part of your time to this work?

A.—I should not like to say that at all. I should have to go very carefully into the matter.

Q.—The statement you have prepared of the number of days spent in each of the five years that you were responsible for the work would give us some idea of that. In 1920 you spent 33 days in Bombay; in 1921, 67 days; in 1922, 63 days; in 1923, 7 days; in 1924, 94 days; in 1925, 7 days.

A.—If it is there.

Chairman.—You ought to take out the separate visit during the monsoon.

Sir Frederick Hopkinson.—During the monsoon visit in July there was nothing going on.

Chairman.—That was in July, 1923.

Mr. Ewbank.—He arrived in Bombay on 13th July, 1923, and went to Baroda and came back to Bombay on the 30th July, and left Bombay for London on the 11th August. That only meant 14 days' difference.

Sir M. Visvesvaraya.—The total number of days is 288 spent in six years, including 1920. That is about 40 days a year. You have already explained why the sea wall was begun from both ends. Should not you have advised Government against the beginning of the sea wall from both ends?

A.—No.

Q.—As it would not have been economical to start from both ends should you not have advised the Government not to start that way?

A.—I have already stated that I did not advise the Government.

Q.—Can you tell me from the engineering point of view why it was that you were against the sealing of the foundations of the rubble mound?

A.—I have already explained that fully.

Q.—From an engineering point of view can you give it to me in a sentence?

A.—From an engineering point of view I did not think at that particular time it was necessary.

Q.—But they told you that the silt was escaping?

A.—Yes, in very insignificant quantities.

Q.—They have worked out that it would be 9 lakhs of cubic yards lost in two years.

A.—Yes.

Q.—That means that about 13 lakhs of rupees' worth of silt was lost?
A.—Yes.

Q.—Do you call that insignificant?
A.—No; certainly not.

Q.—Is not that loss due to your omission?
A.—I have already explained this fully in the evidence. I really cannot repeat every statement that I have made.

Q.—You need not repeat it. They drew your attention to the loss, and you did advise them of your own accord to seal the foundation; but when they suggested sealing you were opposed to that, and I suggest some explanation is necessary.
A.—With all deference, this was dealt with very fully, and is in the Shorthand Notes, and I really cannot go on repeating myself.

Sir M. Visvesvaraya.—Are you satisfied on that point, Mr. Chairman.

Chairman.—It is all here.

Sir Frederick Hopkinson.—There are one or two questions I shall ask him about it.

Chairman.—In the Shorthand Note we see that Sir George Buchanan did not think it advisable to seal it at that particular time, because, as he said, the passage to and fro of the sea would carry with it particles of the silt, and gradually the wall itself would seal up. Is that, putting it substantially, your point of view at that time?
A.—At that time.

Q.—That is how it is on the Shorthand Notes?
A.—Yes.

Sir M. Visvesvaraya.—The silt would come from the sea into the lagoon.

Chairman.—That a certain proportion of silt, probably not of any particular value as regards amount, would gradually seal up the wall of itself?
A.—From the engineering point of view I have described it fully, and it is in these Notes.

Sir M. Visvesvaraya.—In your statement.
A.—In the Shorthand Notes. I have already been examined on that very point at length.

Q.—But you were examined from a non-technical point of view, and I am asking you from a technical point of view. From an engineering point of view kindly give us why it was you were against the sealing of the rubble mound. If you do not want to say, say so.
A.—No; I do not mind in the slightest degree.

Chairman.—It is perhaps quicker to say it.
A.—What I said was that when my attention was called to it there was very little material going away at all. I said: "I do not think at the present moment it is necessary, although it may be necessary to do it later on," and I pointed out that there was a good deal going away through the hole in the wall, and then I went away from Bombay. If the people in charge of the work were so stupid as not to take action on their own initiative when they saw it being done, it is their responsibility.

Sir M. Visvesvaraya.—They say they sealed in spite of your disinclination to agree with them?
A.—I do not agree.

Q.—Anyhow, the 13 lakhs of rupees have been wasted.
A.—So they say, but I will not accept any figure.

Q.—You must accept some figures.
A.—No, I do not accept any figures at all.

Q.—It is a Government Department. The Chief Engineer is your own nominee. You cannot treat their figures in such an offhand manner.
A.—I accept them with great reluctance.

Q.—Why did you permit dredging in Back Bay against your better judgment? Why did you not protest against their undertaking that enterprise? It will eventually cost more than dry filling, will it not?
A.—It was not against my better judgment. I was shown borings showing that there was admirable material in Back Bay. If the borings were not properly taken, and proved to be absolutely untrustworthy, that is the business of the Chief Engineer.

Q.—Did you find out, before you approved of it, whether the dredger could pump into blocks 1 and 2? Did you calculate or make sure of that?
A.—That the "Kalu" would?

Q.—Would the "Kalu" pump beyond blocks 1 or 2? Would it be serviceable without capacity; or would you have to spend a lot of money equipping and starting the work, and then it would dredge a few million cubic yards and stop there?

A.—If the material had been suitable she would have done very good work.

Q.—You say it is due to the incorrect representation of the material?

A.—Yes.

Q.—I am sorry I have to ask some unpleasant questions, but what was the cause of your disagreement with Mr. Lewis?

A.—I had no disagreement with Mr. Lewis; his health broke down.

Q.—In the correspondence there has been some sparring, some disagreement; you must have noticed it?

A.—Yes. But if his health completely broke down——

Q.—He was irritable?

A.—I say his health broke down.

Sir Frederick Hopkinson.—We were told in the evidence that they were not on speaking terms.

Sir M. Visvesvaraya.—Is that true or not?

A.—That we were not on speaking terms—well, I would rather not speak about Mr Lewis. I say that his health completely broke down, and that his whole nature, moral, physical and mental, underwent a change owing to his disease.

Q.—It is very good of you to say that. Why was it that the dredger was ordered and brought there so early, involving idle time charges? I hope you will not say you have already given the reply, as I want it from an engineering point of view.

A.—As a matter of fact I have already given the reply, but the reason was that Sir George Lloyd expected to get the wall started in October 1920. In that case we hoped to have enough done by the end of 1921 for the dredger to work; but as the wall did not start until October 1921, every thing was out a year.

Q.—Even without the wall could not you have started pumping by temporary bunds?

A.—No.

Q.—There is plenty of space in the exposed area in block 7?

A.—No; we could not have done it.

Q.—Could not you have put a wall of moorum and pumped into it? They are all shallow—probably about 2 yards deep.

A.—Well, if the Chief Engineer could have done it he probably would have done it, but he did not think it possible.

Q.—You subsequently made the statement that there was no hurry for the plant: "There is no tearing hurry for the plant."

A.—No; there was no hurry when the wall was not started.

Q.—You can construct a wall of about 1,000 feet and then put in a cross wall, and go on filling at once. That could have been done even from 1922, could it not?

A.—If we could have done it we certainly should have done it. It was not done.

Q.—It was not done, but it might have been done?

A.—No; I cannot say it might have been done.

Q.—The interest charges are about £67,000 to £70,000. A wall of about 10 feet would have secured an area for pumping into in blocks 7 and 8?

A.—Well, it was not taken into consideration.

Q.—Were you submitting programmes of operations to the Government from season to season, and insisting upon their working to them?

A.—We advised them as far as we could. It was not a case for insistence, because we had no power to insist.

Q.—You had promised the Government to ensure a complete and satisfactory supervision of the works?

A.—Yes.

Q.—In order to do your share of the work could not you have insisted upon these things being observed?

A.—Insisted upon what?

Q.—Upon no time being lost, and the dredger being used immediately on arrival: to have prepared in good time for the commencement of the dredging, and to have had a programme of operations, and to insist upon the work being done according to that programme, on an understanding with the officers of the Development Directorate?

A.—Well, there was no case of insisting: it was not possible to insist.

Q.—Were you submitting a progress report of the work from half-year to half-year, that is, comparing the quantities, rates, and amount as estimated, with the quantities and amounts as actually executed, side by side?

A.—Do you mean in money?

Q.—In money and quantities?

A.—No; we never knew what the work was costing. We do not know what the work is costing now.

Q.—Could you not have insisted upon receiving that information?

A.—If the Government of India will not take any action what can you do?

Q.—The Government of Bombay?

A.—The Government of India.

Q.—What have the Government of India to do with it?

A.—I pointed out that they were not keeping any costs, and I had not the faintest idea of what the work was costing, and nobody knew what the work was costing.

Q.—You said that.

A.—That is detailing the action which happened. I wrote to the Director of Development, or rather I pointed it out in my report to the Director of Development, and the Secretary to the Government wrote to the Government of Bombay, the Honourable Member, and then it went to the Secretary to the Government of India in the Finance Department. Eight months later, I think it was, the Government of India in the Finance Department wrote and said: "What is all this about; we do not quite understand it." Then I arrived in Bombay.

Q.—After a year had elapsed they began to take some action. They had taken some action, but it is not satisfactory yet.

A.—Obviously, I could not know what the work was costing.

Sir Frederick Hopkinson.—Is not it frequently the case in Government offices that these things go on and on, and the only thing which stops them is that one of them gets lost?

A.—Yes.

Sir M. Visvesvaraya.—How are the Government and the public and yourself to know how the work stood?

A.—We did not.

Q.—Then why did not you tell the Government of Bombay in an official letter: "I will not be able to fulfil the terms of the contract entered into with you unless you provide for the ordinary procedure practised in engineering works"?

A.—Well, I had already told them in half a dozen different ways.

Q.—But those were all addressed to your Chief Engineer?

A.—As I have explained in this case I went up to the Government of India and no action was taken. If you cannot get anything out of the Government of India it is not much good addressing letters to the Government of Bombay.

Q.—But you did not address the Government of India direct?

A.—No.

Q.—Your recommendations went to the Government of India for practical action?

A.—Yes.

Q.—They took some action afterwards. Probably if you had insisted upon further development they would have carried out your wishes on the costing, but it was not insisted upon, or they thought it was an ordinary thing and left it there. Might not that be the case?

A.—I do not think so. I think you take an optimistic view of what my powers of insistence were in Bombay.

Q.—If I may venture to make a suggestion, they thought that you wanted to take your duties lightly, and so it was no use troubling about these matters. That is what I gather from the correspondence.

A.—I do not think that is so.

Q.—Taking the omission of the programme, the omission of the preparation of progress reports showing quantities and rates and amounts, they would say: "These are serious omissions, their preparation was usually the duties of the Engineers."

A.—Yes, they are usually the duties of the Engineers.

Q.—You stated that the Public Works Department had no reclamation experience. It is not everybody that has reclamation experience; but what sort of reclamation experience is to be expected if the designs are prepared by an expert and there is the ordinary enginering work to be carried out? There are no special difficulties of engineering or construction in this case.

A.—Did I say particularly reclamation experience?

Q.—I think so. You said the local Public Works Department officials had no reclamation experience, in your report?

A.—I think I said marine work.

Chairman.—You can take it as marine works.

Sir M. Visvesvaraya.—What is it that you wanted them to know? What did you mean by that reference to lack of experience of the Public Works Department officials?

A.—Well, the construction of marine works like the construction of a marine wall in a heavy sea.

Q.—You know that the Bombay sea wall was being constructed by engineers in Bombay Presidency?

A.—Yes.

Q.—You know that previously the Port Trust Chairmanship and offices had been held by Government engineers?

A.—I know that.

Q.—There are several local engineers there?

A.—I make no reflection whatever on the officers of the Public Works Department.

Q.—You gave that as a reason for appointing people from outside; that is the reason why I am asking you questions.

A.—As a matter of fact, Mr. Lewis was a Public Works man.

Q.—Did the officers whom you appointed as Resident Engineers possess technical experience of this kind?

A.—Yes.

Q.—When a Consulting Engineer like you has prepared the design, the details are all matters of ordinary engineering practice?

A.—Yes.

Q.—The expert advice was all supplied by you?

A.—Yes.

Q.—You think the Public Works Department officers were not competent to carry on the work, and so you wanted special officers appointed from outside?

A.—We did appoint Public Works officers.

Q.—One or two; but the regular Public Works Department was tabooed. You said you did not want them. You have stated that in your statement and in your original report.

A.—I have nothing to add to that. I quite agree that the Public Works Department engineers would have been suitable. We got one.

Q.—Have you any objection to the Public Works Department supervising that work?

A.—I have not the slightest objection to the Public Works Department.

Q.—*Except that it is slow?*

A.—*I have no objection to the Public Works personnel, but I think that the procedure of the Public Works Department is capable of a great deal of improvement.*

Q.—You have stated in some place that the new Department had not the experience of the Public Works Department—it was lacking in experience.

A.—I have said that, and I have said that I thought the creation of the Development Directorate was a mistake, and that the Development Directorate degenerated into an ordinary Government Department, slavishly following the other Departments, held down by rules and regulations and restrictions just as if the Public Works Department had been carrying it out. It was on exactly the lines that are adopted by the Public Works Department, and it was subject to the same rules and regulations, but without its experience.

Q.—Did the officers nominated by you possess such experience? Could you name them?

A.—The only officers nominated by me were Mr. Lewis, Mr. Elgee, who certainly had had a great deal of experience of sea work, and Mr. O'Rorke.

Chairman.—Was not there Mr. Brims?

A.—Yes.

Sir Frederick Hopkinson.—And Mr. Thomas?

A.—No; I had nothing to do with Mr. Thomas.

Sir M. Visvesvaraya.—He was appointed from here.

A.—A large number of applications were invited, and he was chosen. Mr. Thomas was a local man appointed in Bombay.

Q.—Who prepared the indents for home purchases?

A.—The indents for home purchases were sent home.

Q.—What was the procedure followed in the case of those indents?

A.—The procedure followed was that the indents were sent to my office, and my office took any tenders. The tenders were sent to the High Commissioner—I think it was the High Commissioner—and we recommended the tender and the High Commissioner accepted our recommendation or not as he thought fit, and he placed the order and we inspected the goods.

Q.—And despatched them?

A.—No; we did not despatch them. They were despatched by the Director-General of Stores.

Q.—Final approval lay with the Director-General of Stores, I take it?

A.—Yes.

Q.—And the indent was submitted by the chief engineer direct to you?

A.—Through the Director of Development.

Q.—With his approval, I take it?

A.—I take it, it was certainly with his approval.

Q.—And the final tender or estimates were not approved by the Development Directorate, but by the Director-General of Stores?

A.—Yes.

Q.—Did any Government officer make any changes in tenders recommended by you, in your whole experience?

A.—I cannot remember at all. I think it is unlikely.

Q.—Were you ever consulted about the indents for local purchases in India?

A.—Never.

Q.—That is a matter on which you were never consulted?

A.—No; I never knew what had been purchased.

Sir M. Visvesvaraya.—When you went to Bombay, what are the points you went over with the engineers? Did you not take stock of the whole position?

Chairman.—As you are coming to a new subject perhaps it would be convenient to break off.

Sir H. Courthope-Munroe.—Before we break off may I just clear up this point? I understand it is agreed now that we should have the Shorthand Notes?

Chairman.—Certainly.

Sir H. Courthope-Munroe.—May we have that document returned?

Chairman.—You may remember that you anticipated that we might be taking weeks over this.

Sir H. Courthope-Munroe.—I did not.

Chairman.—I can assure you it will take less than five minutes. We hand it back to you, but it is an example of the value of producing the document.

Sir H. Courthope-Munroe.—Thank you.

Sir Frederick Hopkinson.—I assume we shall see it to-morrow. I shall have one or two questions to ask.

Sir H. Courthope-Munroe.—I am perfectly willing anything should be got, but these being original documents we did not want to part with them.

Chairman.—They show exactly how the matter was made up.

Sir H. Courthope-Munroe.—Sir George has been in attendance here since Thursday. He is a busy man, whose time is money. He has represented to me (he hoped to finish to-day), that to-morrow will be the very last day he can undertake to be present personally. We have the other witnesses; but to-morrow, as far as Sir George is concerned, I understand it, must be his final attendance here.

Chairman.—We will consider that this time to-morrow.

Sir H. Courthope-Munroe.—You understand the position as he conceives it? He is being paid no fees whatever. He is coming here to assist the Committee to make its report, and he is giving full and frank information.

Chairman.—It is a little broader than that.

Sir H. Courthope-Munroe.—I venture to think that is the effect of it.

Chairman.—It is a little broader than that.

(*Adjourned to to-morrow at* 11 *o'clock.*)

The Committee Assembled at 11 a.m. on the 2nd November, 1926, all the Members being present.

The examination of Sir George Buchanan was continued.

Sir H. Courthope-Munroe.—Since the meeting last night, Sir, Sir George Buchanan has turned up a letter which he wrote to H.E. Sir George Lloyd, the Governor of Bombay, making a complaint, and, in view of your questions about why Sir George did not make complaints, it might be as well that you should have the letter handed in to you, and for Sir George to refer to it. (*The letter was handed to the Chairman.*)

Chairman.—The letter is dated the 31st July, 1922, and is written from Victoria Street by Sir George: " I began a letter to Your Excellency some time ago, but decided, as Sir Lawless Hepper was on his way home, to wait until I had seen him, as I know you have quite sufficient worries without my adding to them. At our last meeting in Bombay I told Your Excellency that there seemed to be some misapprehension as to our position. Mr. Lewis appeared to be regarded as the Chief Engineer in fact as well as in name, and that at the meeting of the Advisory Committee I was not even introduced to the members. After my return home we were very much concerned at the absolute cessation of all letters and reports from Mr. Lewis, and on the 3rd June, 1922, I wrote a strong letter of remonstrance, and sent a copy to Sir Lawless Hepper. Since then, and I think principally because Mr. Lewis has gone on leave, the veil has been lifted, and we are getting our reports by nearly every mail. Sir Lawless Hepper called here on the 26th, and I showed him a letter, of which I enclose a copy, the original having been despatched. The letter speaks for itself, the gist of it being we should like to do our job according to our reading of the agreement. Mr. Lewis, either through ill-health or a misconception of our position, has been keeping us in the dark and treating us as consultants. Sir Lawless Hepper takes our view, and the matter will have to be cleared up if and when Mr. Lewis returns to duty." Then there is a matter about South Africa. " I have written this letter because I know how very interested Your Excellency is in everything connected with the Back Bay Scheme, and would like to hear of any difficulties direct from me." That is dated 31st July, 1922. The letter speaks of an enclosure, Sir George?*

A.—Yes, I think that is among your documents.

Q.—May we just identify it. It should be round about July, 1922, if we have it?

A.—I can give you a copy of it.

Q.—It will not take you a minute to tell us if I hand you my copy of the documents. *There* is the 9th June (*handing document to Witness*). Your letter is the 31st July. Will you just pass through those letters from the 9th June?

A.—No, you have not got those letters.

Q.—Will you let us have a copy of it?

A.—I will.

Q.—Would you like to have this back?

A.—The original is with Sir George Lloyd.

Q.—Have you another copy?

A.—I am not quite certain.

Q.—I think perhaps the best plan is that you should give us a copy, and retain that. Is there anyone whom you could send down to get a copy of the letter enclosed, or will you give us the substance of it?

A.—I will try to get it for you after lunch.

Chairman.—Thank you very much. Will you now proceed to put your further questions, Sir M. Visvesvaraya?

Sir M. Visvesvaraya.—Did you get any reply to, or acknowledgment of that letter from Sir George Lloyd?

A.—No; but what happened was, that when I did get to Bombay I had a long interview with Sir Chimanlal Setalvad in Sir Lawless Hepper's presence. All the real action that was taken, however, was that Mr. Lewis's letters were directed to be sent through the Director of Development instead of to me direct; otherwise, the main issue was evaded. It is not evidence, but I remember that Sir Lawless Hepper told me that he was not pleased with me for addressing a letter direct to the Government.

Q.—In reference to my question of yesterday, have you worked out any figures of your own showing the time you spent in Bombay?

A.—I do not quite understand you.

Q.—What time did you spend in Bombay?

A.—You have all the particulars.

*See Appendix XIII.

Q.—But have you worked out independently any figures showing how many months you spent in Bombay? You remember I put the question yesterday?

A.—I have given the figures to this Committee.

Q.—You have given a general statement?

A.—No, I gave a detailed statement.

Q.—But in that statement you included work which you did outside Bombay. Cannot you give us the actual net time which you spent on the Bombay work? However, we have got some figures. Do you consider that you have devoted the greater part of your time to the work as stipulated in the contract?

A.—I consider I have done everything within the contract.

Q.—If Sir Lawless Hepper complains that you were in Australia or in other places, that is not a reasonable complaint?

A.—He never has complained.

Q.—In your own statement you mention that he has complained and that you have answered his allegation.

A.—He never made any complaint of me.

Q.—Sometimes you were in Australia and sometimes elsewhere?

A.—I was not a whole-time officer of the Government.

Chairman.—In his statement Sir George Buchanan said that before he went to Australia he had an interview with Sir George Lloyd——

A.—No, with the present Governor, Sir Leslie Wilson.

Q.—Yes, with the member in charge, and with Sir Lawless Hepper, and they discussed Australia and knew perfectly well he was going, and did not ask him to stay or suggest that his presence was necessary. That is how Sir George has dealt with the matter.

Sir M. Visvesvaraya.—You have not got a list of the plans and specifications which you sent out from London for the permanent works?

A.—No, I have not.*

Q.—Yesterday you stated that you would be prepared to show that the dredger would be a success if the staff was completely changed according to your wishes?

A.—Yes.

Q.—Do you expect to be able to do the work at the estimated cost of 5 annas, or even 8 annas?

A.—I could not say, because I am not now associated with the work.

Q.—But you said it would be possible to work the dredger according to the estimates?

A.—I cannot guarantee anything now, as I am no longer in touch with the work.

Q.—But you feel assured that the dredger is capable of doing its output?

A.—I have said that several times.

Q.—Do you expect to be able to do the work if the whole plant is placed under your direction, and you are allowed to deal with the staff as you think best? Do you think you will be able to do it at any specific rate, and do you expect to be able to pump material into the middle blocks?

A.—That is a hypothetical question, because I have nothing to do with the work at present.

Q.—You have nothing to do with the work now, but you had something to do with it originally, when you had charge of it. You stated yesterday that if you were given a free hand, you would do the work?

A.—Yes, but I have never been given a free hand.

Q.—If you were given a free hand now, would you be able to prove that the dredger could give the promised output?

A.—I should have a very good try.

Q.—That is all?

A.—I should have a very good try. I cannot bind myself down.

Q.—Then you have modified your statement. Yesterday you said that, if you had an opportunity, you would prove that it was a success.

A.—I would prove it was a success.

Q.—Now you say you would " try " to prove it?

A.—I have never been asked. I cannot go and guarantee what would happen if I was given complete control. That is a hypothetical question.

Q.—Nobody else says that the dredger is capable of doing the work which you have promised about it. I asked you yesterday whether you could prove it if you had your own way and staff. Now you say you would " try " to prove it?

A.—No; I say it could be done, but the occasion has never arisen.

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* See Appendix XIV.

Q.—" It could be done." You do not undertake to *prove* it could be done?

A.—I have never been asked. I am not going here to give any undertaking I have not been asked.

Q.—But if you were asked, you would do so?

A.—If I were asked I should consider the matter.

Q.—Then the statement you made yesterday, that you could prove that it would give the proper output, is not to be accepted as a final statement? You stated that yesterday.

A.—I do not quite follow.

Q.—You stated yesterday that, if you were given an opportunity, you would prove that the dredger complied with all the conditions under which it was purchased?

A.—Yes.

Q.—To-day you say, " I will try." Will you kindly give me a definite answer, and I will close my question?

A.—Will you put it to me, Mr. Chairman?

Chairman.—Sir M. Visvesvaraya says that yesterday you asserted that you could prove that the dredger would do her guaranteed output. Sir M. Visvesvaraya is of opinion that, this morning, you are rather going back on that and qualifying it by saying you would merely try; but, as I understand your evidence, from first to last you have always asserted that the dredger could do the work for which she was designed?

A.—Yes.

Q.—Namely, to dredge 2,000 cubic yards per hour of soft clay?

A.—Yes.

Q.—And you say, " Given proper team work, proper coal and proper incentive, and a dredging master with driving power," you believe you would get that result, or so nearly that result that nobody would quarrel with it?

A.—That is it.

Chairman.—That is how I understand it.

Sir M. Visvesvaraya.—At that rate?

Chairman.—Yes, at the rate of 2,000 cubic yards per hour of soft clay.

Sir M. Visvesvaraya.—And five million cubic yards per annum?

Chairman.—Yes, or so near that nobody would quarrel with it.

Sir M. Visvesvaraya.—Do you expect that the dredger would pump into the middle blocks also? You have, in all, eight blocks. One dredger is pumping now into blocks 8 and 7. Do you expect that the other blocks could be filled also from the same dredger?

A.—I am sorry; but I cannot go into these questions.

Q.—Is it because they are difficult?

A.—No.

Q.—You have designed dredgers and pipe-lines, and I ask you whether you would make sure that the middle blocks could be pumped into, and you now hesitate to give an answer?

A.—Yes, the middle blocks could be pumped into.

Q.—At the rate of 2,000 cubic yards per hour?

A.—I really cannot go into these details.

Q.—This must be the A B C of your work?

A.—I really cannot go into all these details of the execution of the works.

Sir M. Visvesvaraya.—As long as that is noted——

Chairman.—Is it a question of distance?

Sir M. Visvesvaraya.—Yes.

Chairman.—Would you put the distance to him? Have you the distance measured off?

Sir Frederick Hopkinson.—I will deal with this point.

Sir M. Visvesvaraya.—Of course, we recognise that pumping could be done if no regard is paid to the cost, but the main point is whether the work could be done at the estimated rate or at any reasonable rate, and whether the dredger could pump into all the blocks comprising the reclamation area. Now with regard to the tenders for the sea wall. The tenders are not in the usual form in which they are usually sent out to contractors, are they? Your tender form required the contractors to do much of the work which the engineers are expected to do themselves. For instance, you ask the contractors to submit in detail their proposals for carrying out the work. Is it not usual for the engineer himself to do that part of the work—the detailed proposals for carrying out the work?

A.—If you will excuse me, Mr. Chairman, this is a matter of our practice and procedure, and I am not prepared to enter into a discussion as to whether we were right or wrong in the professional practice which we adopted.

Sir M. Visvesvaraya.—This is an engineering question.

Chairman.—You can say in answer to it, Sir George, " That was our practice. It may be a good practice or a bad practice, but it is one which we have pursued for a number of years."

A.—That is our practice.

Chairman.—Put your question again, Sir M. Visvesvaraya.

Sir M. Visvesvaraya.—You want the contractors to specify all the plant they would require to carry out the work and the cost thereof; you want them to give a list of the staff and their salaries and office expenses; you want them to state the amount of percentage over and above the estimated cost they would require to carry out and maintain the work; furthermore you want the contractor's account books showing all discounts, rebates, commissions, and similar allowances; you also want the accounts and vouchers to be handed over to Government on completion of the work. I am only asking whether those conditions were not unusual?

A.—No.

Q.—Can you mention any big works in regard to which such conditions were observed? I may be wrong; I may be ignorant of them.

A.—I suppose you can get a number of examples, but I am not in a position——

Q.—Will you give me one example after lunch?

A.—No. I personally am not going to go into that matter. That is the practice we adopted, and we stand by it.

Q.—Is it only your firm which adopt that practice, or is it generally adopted by all firms?

A.—I will not say anything about it. We thought that was the best way to do the work.

Q.—All I want to know is whether those proposals should have been put forward by the engineers, and whether they are part of the engineers' responsibilities? If you say No, I will have your opinion recorded; that is all. I have a few questions to ask you about your statement. On page 29, paragraph 35, you say, " He would give me his entire and absolute confidence "—that is the Governor—" and if I said the scheme was impracticable he would turn it down at once and start on something fresh, but once my opinion was given he would refuse to allow any other expert to report, and he asked me not to let him down." Do you not find it an advantage in your practice to consult other experts, and take into account the experience of other works in your practice?

A.—I do not see how this arises out of this letter.

Q.— . . . " he would refuse to allow any other expert to report." That is his concern and not yours?

A.—Yes. That is a question which ought to be addressed to Lord Lloyd.

Q.—Now I want to put a question to you on paragraph 41, page 36, where you say, " Mine was the usual report prepared for a client prior to the preparation of working drawings and specifications." In the case of Mr. Kidd's scheme, it was expressly understood that the detailed project would be submitted and the work would be allowed to be proceeded with; but your scheme was allowed to be interpreted as a complete and reliable scheme. I only ask you to give me an answer, Yes or No?

A.—Mine was a report upon Mr. Kidd's scheme.

Q.—That is true, but you stated that yours was a reliable estimate, and Government understood it as such. Is there anything anywhere in the reports of the Government, or in your own report, to show that your estimate was an approximate figure?

A.—It was an estimate.

Q.—You state subsequently that it was an approximate estimate, but at the time you did not say so. It is expressly stated in the report of the Government of Bombay in regard to Mr. Kidd's scheme, but not so in the case of yours.

A.—Yes.

Q.—That is the point?

A.—Yes.

Q.—I only want information.

A.—Yes. Well, it was an estimate.

Q.—It was not understood at the time that it was an approximate estimate?

A.—Excuse me. What is the meaning of the word " estimate "?

Q.—What is the meaning of the word " estimate " in your mind? What is a " reliable estimate," and what is an " approximate one "?

A.—I should like you to look at the dictionary meaning of the word " estimate."

Q.—" Reliable estimate " and " approximate estimate " are two kinds of estimates?

A.—What does " estimate " mean?

Q.—An estimate is the value of the work derived from experience on similar works.
A.—Yes.

Q.—If that is so, was yours a reliable estimate or an approximate estimate? Reliable and approximate are not one and the same thing. If it is reliable it is not approximate; if it is approximate, then it is not reliable; you have to prepare another estimate?

A.—I should like you to read the meaning of the word " estimate " in the Oxford Dictionary.

Q.—Very well, I will drop that question. On page 39, paragraph 49, your statement reads: " I understood my firm would be in sole charge and control and that our Resident Engineer would be free from numerous restrictions on the economical execution of work which obtains in India on works carried out by Government." An engineer advises the principal about the conduct of the work, but he is not in sole charge and control, is he? Why should you not have regarded the Development Directorate as the contractor for all practical purposes, and adapted your duties accordingly?

A.—The Development Directorate was in the position of contractor?

Q.—They incurred the expenditure; they carried out the work, and of course the Development Director could overrule you. He combined in himself the duties of the contractor and the supervising authority. If he overruled you, could you not have gone to the principals then—the Government?

A.—Yes.

Q.—The engineers cannot be given the sole charge and control of any work. They are advisers. They can prepare and put out a programme. They are technical advisers, and as such, if their advice is followed by Government their responsibility ceases?

A.—Yes.

Q.—But you did not carry out the Engineers' duties, you say, because they did not respond. The Development Directorate did not respond, and you did not insist upon the Development Director doing his share of the contract?

A.—I had no power to insist that the Development Director should do so.

Q.—You could have represented it to Government?

A.—I think I have represented it to Government.

Q.—Specifically? You have allowed yourself to fall into an indifferent position with reference to the work, have you not?

A.—No, I should not say so.

Q.—You have not been definitely carrying out your duties, simply because another official of Government obstructed you. Your statement amounts to that, does it not?

A.—I cannot go beyond what I have put in my statement.

Q.—On page 44 you say, speaking about Messrs. Simons & Co.'s tender, " I was not far out when I told you that if the order was not placed before the 12th March, it would cost your Government another £100,000 ". When they put up the price in that way, why did you not ask other firms of dredger builders to tender again?

A.—By that time it was in the hands of Sir John Biles, and the Stores Department.

Q.—It may have been, but when they raised the price, would it not have been well to have advised them to call for tenders, even at that late stage?

A.—But I did not know. That is a question you should address to the Director-General of Stores. I did not know what the price was until the contract had been let. I had nothing whatever to do with the letting of the contract.

Q.—The prices were discussed by you before you gave the advice?

A.—They were discussed. Really, I have nothing to add to what is in this statement.

Q.—Again, on the same page you say, " I understood you would be adverse to dual control in connection with the scheme because if the dredger did not do its work, we should turn round and say that as we had had nothing to do with the dredger, we could accept no responsibility."

A.—I have dealt with that in my previous evidence.

Q.—On page 55, paragraph 69, you say " To represent and assist the engineers there is appointed a resident engineer and staff of assistants, who are under the direct orders of the engineers. Their salaries are paid, in some cases, by the engineers and in others by their clients, depending upon the terms of the agreement, but there is no dual control and the duty of the resident engineer is to carry out the engineer's orders, to see that the work is executed in accordance with plans and specifications, and to measure up the work done from time to time in order that the engineers may issue certificates for payment of the contractors."

A.—Yes.

Q.—" The resident engineer also sends the engineers progress reports, progress plans and sections and corresponds regularly with the engineers." Did you help in measuring up the work? "

A.—How do you mean " measuring up the work? "

Q.—Checking the work done on the works? Was not the work measured up and checked by any of your representatives?

A.—Our representative was the resident engineer.

Q.—Did you check the work independently?

A.—No.

Q.—The resident engineer was the Development Directorate's agent?

A.—Yes.

Q.—He was also your agent?

A.—He was also our representative.

Q.—Did you check the work of the resident engineer?

A.—Why should I? He was the man to do the work. If I got someone to check him——

Q.—There must be somebody to check the work of the man on the spot?

A.—There is a limit to checking.

Q.—Do not the engineers measure up the work from time to time and keep a record of the progress of the work?

A.—The resident engineer does.

Q.—But are not the engineers also responsible?

A.—No. As a rule the resident engineer is the engineer's servant.

Q.—He may be the servant, but are not the engineers themselves responsible for watching the progress of the work, the quantity rates and the amounts of expenditure?

A.—If you mean, do we ever personally go and measure up the work, we do not. We have our representatives.

Q.—You have some officer or representative of your own to measure up the work so as to give your principal a report as to the exact quantity?

A.—Yes, and that is our resident engineer. Our resident engineer in this case was Mr. Lewis.

Q.—Then did you accept his measurements as final and correct?

A.—I do not think he ever made any measurements.

Q.—If he did not take any measurements, should you not have insisted on his taking the measurements and keeping the accounts up to date? You did once?

A.—It is on the records.

Q.—But a general report, or a remark like that, did not relieve you of the responsibility of insisting on all the regular duties of the resident engineer being duly performed?

A.—We could not do any more than we did do. We wrote to the Governor of Bombay, and we made a fuss about the cost accounts.*

Sir M. Visvesvaraya.—I think those are very sound remarks which you made about the cost accounts. I must admit that.

Sir Frederick Hopkinson.—But we have not seen any cost accounts.

Sir M. Visvesvaraya.—On page 63, paragraph 80, you say, " We agreed to perform the work for 2 per cent., and we have only been paid 1½ per cent." Have you any objection to stating the total payment received up till now?

A.—I have not the faintest idea. If you were to take the net payment, expenses in our office, income tax, and one thing and another, you would be surprised how small it was.

Sir Frederick Hopkinson.—I think that applies to all of us, Sir George.

Sir M. Visvesvaraya.—At page 67, you state in the first paragraph, " We consider any revised estimates at this stage quite impracticable. In six months partial, and in two years complete, revised estimates possible." Why did you regard the preparation of revised estimates as impracticable?

A.—It was our opinion at the time. That was our opinion, the way the works were going.

Q.—It was not that you thought that it could not be done in a reasonable time?

A.—It could have been done by other people. It could not have been done by these people.

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* See Appendix XIX.

Q.—You state lower down, " We received, in reply to our cablegram, a letter from the chief engineer dated 19th August, 1921, saying that the estimates were required for political purposes, and were given by him on the understanding that they were not binding, and he had also stipulated that they should not be published." Is that the 702 estimate to which you refer?

A.—No. That was an estimate prepared for political purposes.

Sir M. Visvesvaraya.—What was the amount of that estimate?

Chairman.—It must be the estimate on which Lord Lloyd based his speech on the 9th August, 1921.

Sir M. Visvesvaraya.—702 lakhs?

Chairman.—Roughly 7 crores. Curiously enough, it was 702 lakhs. The date was the 9th August, 1921. That was the date of the speech made by Lord Lloyd.

Sir M. Visvesvaraya.—At the top of page 69 you say, " We do not propose to give any more detail in the revised estimate than in the original one." May I ask why you did not propose to give any more detail?

A.—We proposed to make our revised estimate on the same basis as the one in the book.

Q.—How could it be a reliable estimate unless it were detailed, with specifications, plans, and estimates? Unless these were all given, how could it be a reliable estimate? You meant to have the 702 lakhs estimate on the same basis as the 367 lakhs one?

A.—The chief engineer was working out his detailed estimates, which were being approved one by one by the Director of Development.

Q.—But there should be some check of the details also, should there not, or do you not think it necessary?

A.—I had nothing to do with the checking of the details. It was not within my province.

Q.—But the preparation of estimates is your job?

A.—It was not within my province.

Q.—The preparation and approval of the estimates is the work of the engineers, is it not?

A.—We are getting back to what we were discussing yesterday.

Q.—Just say yes or no?

A.—Estimates, yes.

Q.—And you say you did not want to give any more detail. Why did you not want to give any more detail?

A.—I am referring, and I suppose you are referring, to such works as the Khandivli Quarry and all the temporary works in connection with the scheme.

Q.—They come in the cost?

A.—Those are details.

Q.—You do not think you should go into them?

A.—It was not within our province. That is done by the Chief Engineer and Director of Development.

Q.—They are one of the acknowledged duties of the responsible engineers, are they not?

A.—No. I think we argued that at length yesterday.

Sir M. Visvesvaraya.—If you do not want to go into it I will leave it.

Chairman.—Sir George does not say he does does not want to go into it. What he says is : " I think I have already covered it in my previous answer."

Sir M. Visvesvaraya.—I want a direct answer on the statement he has made here. He says: " We do not propose to give any more details in the revised estimate." In the original estimate there were no details. He says in the revised estimate he did not want to give any details. (To the witness) : Why was that? Just make a statement, and I will accept anything you say.

A.—I am very sorry, but I do not follow the question.

Q.—You say you did not want to give any details in the revised estimate. May I ask why?

A.—Because the details did not concern us.

Q.—Without your going into details, how can you be sure of your estimate being correct and complete? Even at this time did you want to give an approximate estimate, or did you want to give a proper and correct estimate?

A.—We wanted to give a correct estimate.

Q.—How could you do it without going into details? Without giving details your estimate would not be complete?

A.—I do not think I can follow the question.

Chairman.—The point which I think Sir M. Visvesvaraya is trying to make is this. He says, why did you not go into details? The answer may be that you must yourself have gone into details, but you were giving a skeleton result?

A.—That is correct, yes.

Chairman.—If your details were all right you were merely giving the skeleton result.

Sir M. Visvesvaraya.—But the engineers not only have to give a skeleton result but the details also. In order that the estimate should be complete both the details as well as the skeleton should be given. Will you say yes or no?

A.—I say that is the custom in the Public Works Department in India.

Q.—But not for the engineers?

A.—No.

Q.—They do not give details?

A.—No.

Q.—If modifications are made in the course of the execution without reference to the details and the cost goes up, who will be responsible? How are they to know whether the contractor is going on in accordance with the original work or not unless you have the details?

A.—There again I cannot answer these questions, Mr. Chairman. I am very sorry; possibly I am very stupid.

Q.—No, no, you have your own difficulties; I can see that. On page 81 you say "A costing system would only be of use to the Executive, and of no use to the Audit Office, and he suggested that the present audit system remain unaltered, but that a system be introduced which would be of the greatest use to the Deputy Chief Engineers in charge as it would be of a technical nature and would enable the Deputy Chief Engineers to watch expenditure over each process and to effect economy." I for one entirely agree with all those remarks. It is a pity that the costing system has not been introduced on the work. The only additional remark I might make is that the engineers might have insisted on the costing system being adopted.

A.—I beg your pardon. Who do you mean by the engineers?

Q.—Yourselves.

A.—That we might have insisted?

Q.—Insisted upon the costing system being adopted.

A.—I would like to draw attention to that, because I pointed out very fully that we had no powers to insist on the Government of Bombay taking action.

Q.—You had no power to insist, but you could have made definite representations warning the Government that if they did not do it things would go wrong?

A.—I do not think there could have been anything more definite than the representations which were made.

Chairman.—You mean round about page 78 of your statement?

A.—Yes.

Sir M. Visvesvaraya.—As your agreement was with the Secretary of State and not with the Development Director, your disagreement with the latter did not release you from the responsibility of the terms of the contract you have entered with the former.

A.—One moment. In the case of the accounts my protest went as far as the Government of India and the Finance Department.

Q.—Not in writing. You sent a private note. You did not address an official letter to the Secretary. If you had you would have been entitled to an answer?

A.—I really cannot follow that. I had no power to address official letters to the Secretary.

Q.—I beg your pardon. The other party is the Government, not the Development Director.

A.—What more action could have been taken.

Q.—An official letter could have been written saying "Your Development Director is not observing the terms of the contract strictly, and I cannot be responsible if these things are not done."

A.—In addition to putting this all in my annual official report?

Q.—Yes. Ought not you to have done that?

A.—In addition to putting this all in my annual official report, which was for the use of Government, I should also have written a special letter to Government?

Q.—Yes. That is the usual practice. In reports you may say all sorts of things, which the Government may accept or deny, but on any specific point you could have addressed a specific letter to the Government of Bombay?

A.—I wish to put it on record that in my judgment we could not possibly have done anything more than we did in the matter.

Q.—At page 88 you speak of " The degree of disorganisation reached was discussed between us whenever we met, and latterly, as has been shown, all correspondence with the Chief Engineer passed through Sir Lawless Hepper's hands. As a consequence of Mr. Lewis' illness, the lack of a business like system in the Bombay office, and an atmosphere of hostility more easily felt than describable by a visitor from London, the work was an unhappy one for all concerned." All I mean is that a definite letter to Government might have helped matters. I will leave it there.

A.—It was about that time that a definite letter was written by me to the Governor of Bombay.

Chairman.—And the matter, Sir George, is referred to in the greatest detail, and with great insistence, in the report of the 11th February, 1922, page 9, paragraphs 33 and 34. You brought the thing as fairly as you could to the attention of the Government in your official report. You discuss the whole method?

A.—Yes.

Sir H. Courthorpe-Munroe.—What page are you referring to, Sir?

Chairman.—The report of the 11th February, 1922, page 9, paragraphs 33 and 34, which set out exactly his views and contrast the practice in England and the practice which obtains in India, and where he expresses a very definite opinion about the whole matter.

Sir M. Visvesvaraya.—That is true; that report is all right, but with regard to the contract, a direct statement to Government in an official letter would have brought a direct answer from Government. As a matter of fact there may have been semi-official and unofficial letters, but they do not count as complete official documents. (*To the witness.*) Will you kindly turn to page 92, paragraph 118 : " I have not the proceedings of the meeting but so far as my recollection goes we unanimously considered that for various reasons the work could better be done departmentally. Meanwhile I had been giving the subject serious consideration from other points of view and I came to the conclusion that in the interests of economy it would be better to dispense altogether with the block wall and to revert to the scheme for a rubble wall throughout ". Can you give us any of the various reasons now? It is an important piece of work. You must be fully aware of the reasons. Why were the tenders dropped? That question was raised in Bombay by some of the witnesses.

A.—I have not got my reports here. I know it was considered more economical. In that connection I would like to point out that in Sir Lawless Hepper's evidence he inferred that he had not been consulted at all in the matter of those tenders. I do not think I have got it with me; I intended to bring it, but I can show you a note in my diary of that date in which I state that the tenders were considered by Sir Lawless Hepper, Mr. Lewis and myself and we unanimously decided it would be better to do the work departmentally. I will produce the diary after lunch.*

Q.—Some of the contractors complain that they were put to a lot of expenditure on that account. At the bottom of page 94, paragraph 123, you say: " It should be borne in mind that it was not possible to design the drains, cross-bunds or locate main roads until more was known about the lay-out of the reclaimed area and the preliminary scheme of Mr. Davidge, the expert town planner, was not received by me until March, 1922 ". Why was it not possible to design the drains, cross-bunds and main roads?

A.—Because nobody knew what was going to be done.

Q.—It says drains—that is, storm water drains—and cross-bunds. The development may be left out altogether. You have nothing to do with the development?

A.—No. I have only to repeat that it was not possible to design them until we had the lay-out.

Q.—Why do you want the lay-out? The sea wall is fixed, and that is the end of of the thing. You have nothing to do with the lay-out. Cross-bunds are part of the construction of the reclamation, and also storm water drains?

A.—Well, go to page 95. The Chief Engineer writes: " An inspection of Mr. Davidge's plan indicates the position of the storm water drains for the area of the reclamation. The drains have obviously to discharge under the sea wall and will naturally be placed on the axes of the main avenues running east and west across the area ".

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* See Appendix XV.

Q.—That is according to Mr. Davidge's plan as shown; but there is no reason why storm-water drains should not be placed wherever you find it convenient to place them?

A.—The Chief Engineer here says: " The drains have obviously to discharge under the sea wall and will naturally be placed on the axes of the main avenues running east and west across the area ". We did not know the position of the main avenues running east and west across the area until we had received Mr. Davidge's lay-out.

Q.—On page 110, paragraph 137, you say: " As regards the dredger ' Sir George Lloyd,' we hold the opinion that whatever the class of material (short of hard rock and moorum) no better dredger could be procured for the purpose of the scheme and criticisms on the mechanical efficiency of the dredger are beside the point, because up to the present the dredger has had no opportunity of showing what she can do ". There are two or three points to be considered in this connection. You had no calculations to show that the dredger could give the output which you specified?

A.—You asked me that question yesterday.

Sir M. Visvesvaraya.—And you have not given us instances of any other dredgers of similar size which have given the output you have specified. In actual test they have broken down. They have shown themselves not capable of the appointed task. There are those three points. If you wish to state anything which makes you take such a hopeful view we shall be glad.

Chairman.—We must be careful about the phrase " in actual test " because the " Kalu " and " Jinga " and the " Sir George Lloyd " are all claimed, in actual tests, to have done their job. What you mean is daily practical working.

Sir M. Visvesvaraya.—They have been tested a whole season.

Chairman.—It is only in actual tests. We must be careful that that is not mistaken for the official test. You mean the daily working. Over a period of three years you have an output of less than 50 per cent.

Sir M. Visvesvaraya.—Yes. (*To the witness.*) What makes you take such a hopeful view that the dredger is quite capable of giving the specified output?

A.—I have expressed this opinion before the enquiry.

Q.—There must be some grounds for it. You have not given any grounds. If you can give us any we shall be interested to hear them.

A.—Well, confidence in the plant once you have put it in the hands of a contractor and got rid of all the people out there.

Q.—A dredger which can give 1,000 tons per hour cannot be made to give 2,000 tons per hour even if you put it in the hands of an excellent contractor. We want to know what makes you take the hopeful view that the dredger itself is a sound piece of machinery?

A.—I would refer you to Sir John Biles.

Q.—He refers many things to you. We have asked him " Why do you suggest that? Why did you accept that output? " and all that, and he referred us to you?

A.—This is obviously a question for Sir John Biles.

Sir M. Visvesvaraya.—He says " You had better ask Sir George Buchanan ". We are being sent from pillar to post. On page 112 you say in Clause 5: " Regarding my responsibility, I have no desire to evade any responsibility or unduly to blame anyone else. During the course of this inquiry I have been subjected to attack not only by witnesses but by members of the Committee ", and then you quote statements made in the course of the evidence. One is " Sir M. Visvesvaraya. Witness: Sir Lawless Hepper. (Q.) As regards expenditure for a huge work of this magnitude, responsibility must be that of the Director of Back Bay Reclamation works ". I put that question. How do you hold me responsible for any criticism there?

Chairman.—The criticism is in the answer. Sir George Buchanan objects to the answer which Sir Lawless Hepper has given. That is the point, is it not?

A.—That is the point.

Sir M. Visvesvaraya.—The statement says that he has been subjected to attack by members of the Committee.

Witness.—As regards that question, I think it was most extraordinarily proper.

Sir M. Visvesvaraya.—In that particular case at all events there was no criticism by a member of the Committee.

Chairman.—It is the answer of Sir Lawless Hepper. Sir George Buchanan does not agree with the way Sir Lawless Hepper puts it. You put a question which Sir George considers an ideal question, and Sir Lawless Hepper gives an answer which does not please Sir George.

Sir M. Visvesvaraya.—At page 114 you say: " Sir Lawless Hepper has made the remark that Sir George Buchanan was sometimes in Australia and sometimes in Africa

and it was not practicable to send all cases of tenders for contracts that used to arise. What an extraordinary statement!"—that is your remark—" I was not carrying out our duties single-handed—I was not even the engineer. My firm were the engineers and we had an office and staff in London actively engaged in carrying out the whole of our business." That is true, but you were personally responsible under the contract?

A.—No.

Q.—You had to give the greater part of your time. You say : " I was not even the engineer," but you were personally responsible under the contract for the job?

A.—No, I disagree.

Q.—You did promise to give the greater part of your time?

A.—No; I disagree. Evidence will be given, I hope to-morrow, by my partner, and you will see the amount of work he did while I was away.

Q.—I quite agree he may have done, but you were personally responsible under the contract which says: " Sir George Buchanan shall give the greater part of his time, etc." Did you give the greater part of your time?

A.—I have already replied.

Q.—Then on page 115 you say : " Moreover, I had never any intention of being any thing but adviser, and our fees were based on that arrangement." That question was discussed yesterday.

A.—Yes.

Q.—I do not want to go very much further into it. You gave advice when you thought necessary. May it not be that as you assumed no responsibility they took your advice only when they thought it convenient? They were not bound to take your advice always because you took no responsibility.

A.—They were not bound to take my advice, and very often they did not take it.

Q.—Might it not be because you did not take any responsibility?

A.—No ; I do not associate myself with that remark.

Q.—Then later on you say: " The creation of the Development Directorate and Department I consider, in the light of events, to have been a mistake." That is the creation of the Development Department?

A.—Yes.

Q.—Kindly tell me how you would carry out the work if you had your own way. Suppose the Development Directorate is abolished as far as this work is concerned, how would you carry it out? We want your own considered opinion.

A.—Yes. My considered opinion, in the light of events, is that of letting the work by contract, whatever the cost was.

Q.—Whatever the cost?

A.—Reasonably, I mean.

Q.—Could you do it within the estimate?

A.—I am not talking about within the estimate.

Q.—But anything can be done if regard is not had to the cost?

A.—You asked me what I would do. I say that the creation of the Development Department I consider, in the light of events, to have been a mistake. Very well. You asked me what, in the light of events, I would do, and I say that, in the light of events, I would let all these works by contract. Naturally, when I say at any cost I mean at any reasonable cost. I would abolish the Directorate to-morrow.

Q.—What guarantees are there that things will not go badly again? Merely leaving the work to contract will not help matters. What organisation would you substitute for the Development Directorate? What organisation have you in view?

A.—In my judgment you could not have a worse organisation than the Development Department.

Q.—What would be the organisation under your scheme if you abolish the Department? There must be somebody to control, somebody to measure up, somebody to take stock of progress, somebody to do the costing. What organisation would you have?

A.—It would depend entirely upon what the Government proposed. If they proposed to use engineers——

Q.—We have to make a recommendation on that point, and on your experience of the work you say that the Development Department should be put an end to. I want to know what alternative organisation you would put in its place. It would be a help to us to see exactly what you have in view. This is not criticism ; I am just asking your advice.

A.—In the case of the Back Bay scheme, supposing that the Government retained a firm of engineers like ourselves, or of similar calibre, I should recommend that the work be gone over very carefully, and the work should be let out on a contract basis.

This has already been discussed by the Chairman yesterday, and he said : " Well, you might get people who would take the contract on the basis of receiving so much of the land." That would be a matter for consideration.

Q.—Whom would you have as agents of the Government supervising the work? What Department of the Government would there be? There must be a Department of the Government to look after the work on behalf of the Government.

A.—Do you mean outside the Back Bay scheme?

Q.—For the Back Bay scheme only. You say you would do away with the Development Directorate. What other agency would you substitute in its place on behalf of the Government?

A.—If you take the Back Bay scheme by itself, the Public Works Department would take over the equipment of the reclaimed area, and if there were engineers in this country who carried out the work for the Government there would be no Department necessary.

Sir M. Visvesvaraya.—I quite follow that reply.

Chairman.—You do not mean that you would put the works in the hands of the Public Works Department? Would you put the equipment of the area when reclaimed in their hands?

A.—Yes.

Q.—But the reclamation is to be by the contractor or contractors working under the supervision of an engineer?

A.—Yes.

Sir M. Visvesvaraya.—An engineer under what Department—under the Public Works Department?

A.—No ; an independent engineer. We were not in the Public Works Department.

Q.—You were independent engineers. You want an engineer to be appointed in place of the Development Directorate?

A.—No. May I point out that analogous cases (if information is wanted on this point) are the numerous public works carried on by the Crown Agents for the Colonies in the Colonies who employ engineers in this country?

Chairman.—May I see if I have got that right? Your view is that an engineer should be chosen, and that tenders should be invited—world-wide, I suppose?

A.—No limit.

Q.—And that when you have got your contracts, and when you have got your engineers, the Public Works Department has nothing to do with the reclamation part of the work at all?

A.—Nothing whatever.

Q.—The hold that the Government has are the individual contracts with various contractors?

A.—Yes.

Q.—And their reputation, their solvency, and their ability?

A.—Yes.

Q.—That is what the Government looks to?

A.—Yes.

Q.—And they look to the reputation and supervising energy of the engineer?

A.—Yes.

Sir M. Visvesvaraya.—On page 117 you say : " I emphatically assert that the Back Bay scheme inaugurated by Sir George Lloyd is not a failure, and there is no reason why it should not be brought to a triumphant conclusion." But have you considered at what cost it could be brought to a triumphant conclusion? Could you do it within the estimate?

A.—That is an expression of my opinion. Naturally, by a triumphant conclusion I do not mean at an unreasonable cost. You would arrive at that when you begin making negotiations with contractors or taking tenders from contractors.

Q.—Would it be anywhere near the 702 lakhs estimate which was approved?

A.—Really that is not a question which I can answer.

Q.—Any work can be brought to a triumphant conclusion if regard is not had to the cost. You said that the cost was to be no consideration. That was the idea then. I do not think any Government would accept such a statement as that the cost was to be no consideration in considering an estimate for the scheme. That was the idea when you started the work, but I do not think that principle would be acceptable to any Government in these days.

A.—I went on to say that the slump in land values which at present obtains is not going to last for ever.

Q.—That is true; but I am talking of the cost of the work.

A.—To put it in another way: I consider there is nothing to prevent the work being brought to a satisfactory conclusion at a reasonable cost.

Q.—The prospect of profit has disappeared for the moment. They have to keep a close watch on the cost.

A.—Yes.

Q.—The work is delayed because it is going to cost a tremendous amount, and it is felt if it is to be brought to a satisfactory conclusion it should be done within a reasonable cost.

A.—Yes.

Q.—A reasonable cost must be some percentage, 10 per cent., or 15 per cent. on 702 lakhs. Do you think that work could be completed within that percentage with success?

A.—I cannot bind myself down to what I think is a reasonable cost.

Q.—I am much obliged to you.

A.—Thank you.

Sir H. Courthope-Munroe.—There is one point that has occurred to me which I should like to mention.

Chairman.—I do not at all want to criticise, but you are getting a little far away from the modest way in which you started, and, if I may say so, the correct way.

Sir H. Courthope-Munroe.—It was only on a question put by Sir M. Visvesvaraya. He put the question as to whether the estimate was in Sir George's opinion reliable or approximate. I do not want it to appear that Sir George was fencing with the question. He said he would look at the Oxford Dictionary.

Chairman.—Let us have the Oxford Dictionary meaning of the word " estimate."

Sir H. Courthope-Munroe.—That is all I ask for. It may appear to the looker-on as if he were fencing with the question. The Dictionary gives the meaning as follows: " Estimate: approximate judgment of number, amount," etc.

Chairman.—That is right.

Sir H. Courthope-Munroe.—Then the word " reliable " is defined as being of " sound, consistent character." So that it was impossible in view of that definition for Sir George to give a definite answer, because the word " approximate " is rather involved in the word " estimate." You will forgive my pointing that out; but that is the only reason I intervene.

Sir M. Visvesvaraya.—In engineering parlance " approximate " has a definite meaning. " Final estimate " and " approximate estimate " have different meanings in engineering language.

Sir H. Courthope-Munroe.—I leave it there, but " estimate " seems to involve " approximate."

Chairman.—Let me see if I can get the position quite clear about this. The word " estimate " does not import a definite guarantee of accuracy to the last decimal point?

A.—No.

Sir Frederick Hopkinson.—Under certain conditions, yes.

Sir M. Visvesvaraya.—Exactly.

Chairman.—If you say you have prepared a " reliable estimate," does it *not* mean that you have, as an engineer, taken out the figures with due care, and believe that the work can be done for the price?

A.—Yes.

Q.—It may be in certain circumstances put higher, but generally, perhaps that would be a fair way of putting it?

A.—Yes.

Sir Frederick Hopkinson.—I should like to carry that word " estimate " one little step further. If I, as a contractor, give you an estimate for doing certain work for a certain sum and you, as an engineer, accept that estimate, I have to carry the work out for that estimate have I not?

A.—If you give me an estimate.

Q.—And you accept it?

A.—Yes.

Q.—If you, as an engineer, give the Government an estimate for carrying out certain work, you have such things as supplementary estimates?

A.—Yes.

Q.—Which have a totally different meaning?

A.—A totally different meaning.

Q.—The Chairman has been so very exhaustive that he has left me very little to do but in order that no points may be missed I shall have to go generally through the whole thing, and you will forgive me if I ask any questions that the Chairman has already asked. I will do my best to avoid repeating any question, and I will try to be as short as I can. Before we commence on it I should like to refer to that letter you read out this morning to Sir George Lloyd, where you objected to the term " consultants " as applied to your firm. You have also objected to being called " executive engineers "?

A.—Yes.

Q.—Would you explain to me what half-way house there is between the two?

A.—Well, you perhaps know there is a good deal of ambiguity about consulting engineers and engineers. The late Mr. C. S. Meik used always to object, under any circumstances, to be called a consulting engineer. His view was : " I am not a consulting engineer."

Q.—It is a very common phrase to use?

A.—It is a very common thing indeed. I do not think there is much difference, but I was alluding to the position in connection with Public Works in India. Take the various Port Trusts in India. They have their consulting engineers at home. They are agents for the supply of materials. They never consult those engineers about the works or about anything unless they want to, and my fear was that we were going to be pushed out to such an extent that we were only going to be used as engineers when they wished us to supply tools in the same way as a consulting engineer for a Port Trust. That was the meaning of the expression.

Q.—But they have their own Director General of Stores to do all that, have they not?

A.—Government have their own Director General of Stores, but in this case it was decided that we were to do it.

Q.—In the one case you get a fee over the whole work, but the man who simply is employed to supply plant, and so on, only gets a fee on the value of that plant?

A.—Yes.

Q.—That is a very different thing?

A.—That is a very different thing.

Q.—I have been in a great deal of trouble about this Clause in your agreement, and I have been much governed in opinion by your own statement in which you say : " We interpreted our agreement to mean that we are the actually responsible engineers." That seems to me very comprehensive.

A.—Yes.

Q.—What limits your responsibilty there? There is no limit, is there?

A.—The responsible engineers for seeing that our plans were carried out.

Q.—For the design and execution of the works. The word " execution " I believe is used in another place.

A.—It is not the execution of the works—yes, the execution of the works in the sense of having a representative and seeing that the works were carried out.

Q.—I think it means more than that. I think it means really what it says—that is, the execution of the works.

A.—Well, we never interpreted it in that sense. You have got to take the facts which I have laid down, that we had no power whatever. We had no power and no control.

Chairman.—Sir George and Sir Harry, this is, in our opinion, a very curious and very difficult agreement. I do not know whether you have studied it at all, but I think if you would consent to extend your powers here a little, and would just address us for half an hour at some time on the text of this agreement, and on the point as to how far Sir George was responsible for the execution of the works as apart from supervision, it would be very useful.

Sir H. Courthope-Munroe.—I follow you.

Chairman.—If Sir George is willing that you should do so just to help us, only on that one point and nothing else—I think it would be an advantage. Nothing about the termination of the agreement, but just for you to take Clause 1 and discuss it with us and contrast it with Clause 2. Are you willing that that should be done, Sir George?

A.—I am, certainly.

Sir H. Courthope-Munroe.—You will allow me to do that to-morrow?

Chairman.—At any time convenient to yourself.

Sir H. Courthope-Munroe.—Yes; that would necessarily involve looking up some matters.

Chairman.—The position is that Sir George's firm may be engineers in supervision of the works without any executive duties. On the other hand, pushing it to its extreme

limit, he may be responsible for the execution of the works. That is the extreme limit in which he is engineer plus contractor.

Sir H. Courthope-Munroe.—Quite so.

Chairman.—Those are the two opposite views.

Sir H. Courthope-Munroe.—I quite appreciate the point.

Chairman.—He may in fact hold a sort of hybrid position in which he is engineer, and yet by virtue of supplying various articles and certain drawings and plans, he may be, in those circumstances, assuming the position of contractor. It is the measure of responsibility that one would like to have discussed under this agreement. If you could just, within the limit of half an hour, put Sir George's view and your interpretation of it as a lawyer, it would help us.

Sir H. Courthope-Munroe.—I gather you are asking me for that—an interpretation from the point of view of the law?

Chairman.—Yes; your interpretation as a lawyer, and what you say is the true construction of that agreement on that one point—engineer, executive power, contractor. One end the engineer, and the other end engineer plus contractor. It is a very curious agreement.

Sir H. Courthope-Munroe.—Quite.

Sir Frederick Hopkinson.—It is a very important point, because I have read it in one way which gives a totally different position to that assumed by Sir George Buchanan.

Sir H. Courthope-Munroe.—I quite appreciate it.

Sir Frederick Hopkinson.—It is capable of that reading, but we want to know the proper reading. We do not want to have a wrong reading of it.

Sir H. Courthope-Munroe.—You may not obtain even that until you get the Judgment of the House of Lords; but in answer to your questions, what I would suggest is for the purpose of this Inquiry you have to look at what in fact it was understood to mean by all the parties.

Sir Frederick Hopkinson.—I quite agree that that is very important.

Sir H. Courthope-Munroe.—I suggest so far as this Committee is concerned that is the position. I fully appreciate the importance that Sir Grimwood Mears attaches to the real legal meaning of the document; but for this Inquiry you have to look at what everybody thought it meant.

Chairman.—Certainly.

Sir Frederick Hopkinson.—I quite agree.

Sir H. Courthope-Munroe.—I fully appreciate the point. The same point had struck me when I read the papers.

Sir Frederick Hopkinson.—In the meantime that will not prevent me asking these questions that I have already decided to ask.

Sir H. Courthope-Munroe.—No.

Sir Frederick Hopkinson.—While we are on that point, I should like you to bear in mind, Sir George, that reading the document exactly as it is written there has coloured many of the questions that I have put to witnesses in Bombay.

A.—I appreciate that.

Q.—Have you got any plan made in 1919 showing how you proposed to work the dredgers—their position, etc?

A.—No, I have not got any plan made in 1919.

Q.—Can you tell us how you proposed to work the dredgers? I particularly want the non-technical Members of the Committee to understand this point, as you and I of course do.

A.—In 1919?

Q.—Yes; when you made your report in September can you tell me where you were going to put your dredgers, in order to make the reclamation?

A.—Certainly it was not put down on paper, it was discussed.

Q.—Discussed with whom?

A.—It was discussed with Mr. Meik.

Q.—What conclusion did you come to?

A.—Well, the conclusion, so far as I can remember when it was decided to begin the wall at both ends——

Q.—I am speaking now of 1919. There was no question then of building the wall at both ends?

A.—No.

Q.—Will you take your plan from that pocket? There you have got pipe-lines 1, 2 and 3?

A.—Yes.

Q.—Your limits of delivery of the material from the booster was 5,000 feet, I think?

A.—Yes, 5,000 feet from the booster.

Q.—I have plotted these on to this plan, and it seems to me that it was impossible for your booster to deliver the material into either one of the sites shown on your plan, that is to cover the sites?

A.—I know it was discussed at the time; and the reply is that we had at the back of our minds a land booster in addition.

Q.—But that does not appear in the estimates?

A.—No, it does not. We discussed it a great deal, and we thought it might be necessary to have a land booster. On the other hand we were not certain whether it would not be more economical to use 14,000 or 15,000 more feet of pipe-line at a reduced output.

Q.—Had you done it at a reduced output, your whole programme went, did it not?

A.—We did not mean a reduced output for the whole of it.

Q.—It is not the fact that at one time you thought of this land booster working in conjunction with the one dredger in the harbour, and not in conjunction with the "Lloyd" and the "Colaba"?

A.—No; we always had the idea that we sould want a land booster in conjunction with the "Lloyd" and the "Colaba."

Q.—I know that appeared subsequently when you are making progress at a later date—a year or two years or three years later—and if I remember rightly the price of this land booster was £172,000?

A.—The land booster?

Q.—Yes.

A.—What we were considering at the time was this.

Chairman.—Do you agree the price? Is that approximately right—£172,000 for what was called a shore booster?

A.—I do not recollect it. I have no recollection of that.

Sir Frederick Hopkinson.—That will come later on, when I go through the figures. Surely if you thought of using a second booster—that is equal to a third dredger—it was going to increase your price by nearly 50 per cent., was it not?

A.—We had no suggestion of having a booster to cost £172,000. You must remember this is a long time ago, and I cannot remember all the details.

Q.—I understand that.

A.—I remember in discussion with Mr. Meik that we thought we might have a land booster worked by electric current.

Q.—You intended originally to have a booster worked by current, but you found that the current was not available?

A.—That was right.

Q.—Therefore you put in the "Colaba"?

A.—That is right.

Q.—A steamship?

A.—Yes.

Q.—But is not that only reverting to your original programme of having two machines for doing the entire work, because in your report there is no reference whatever of any kind to a third machine for delivering the spoil?

A.—No, that is quite true.

Q.—Had you really seriously intended that? Surely there would have been a mention of it, would there not?

A.—Any work outside the report as it stood we would not make a definite statement as to——we would see how things worked out.

Q.—But that would vitiate your whole estimate, would it not? That would illustrate the definition I gave you just now of the difference between the contractor's estimate and the engineer's estimate? That would really come in the nature of a supplementary estimate?

A.—Yes, but at that time things were put into what fraction of an anna is this going to put on to a square yard of land.

Q.—I am far, shall I say, too non-political a person to consider anything of that kind.

A.—That is my answer. I have nothing more to say.

Sir Frederick Hopkinson.—I want my colleague to understand this point, so I will just put this plan on the wall, and I will make a few remarks about it.

Sir H. Courthope-Munroe.—Is this plan No. 1?

Sir Frederick Hopkinson.—Yes; I am taking the same plan that you have. We have larger ones here, but I think it better to take this one, so that you can follow it more easily. Here is pipe-line No. 1 and here is pipe-line No. 2, and here is pipe-line No. 3. This is the area of dredgable material?

A.—Yes.

Q.—Assuming that your dredger is somewhere in this area, the "Colaba", that is the booster, would be in that position. Now here the limit of practical effective dredging is 5,000 feet, and that is represented by this pencil line which I have etched as her maximum delivery. That means that all this area could not be done by the "Colaba" at her maximum rate of output. It is quite a large area. I would also point out that the reclamation nearer the wall is much deeper than it is here. It begins practically at nothing here, and goes out to about 15 to 20 feet up here. Consequently this is a very large proportion in quantity and area of the reclamation. To give you an idea of the quantity the distance beyond which you could pump effectively to the sea-wall is 1,700 feet. That is getting on towards half a mile. In the case of No. 2 pipe-line here is a similar radius of 5,000 feet drawn on, and that shows also that she could not do it. Now when we come to pipe-line No. 3, the "Colaba" being here, and the "Sir George Lloyd" being somewhere in that radius, 5,000 feet, the maximum distance to which she could pump is shewn by this line here. That means all this portion here could not be done at her effective rate; and this portion from here to the end, which is Block 1 and Block 2, is a distance of 5,000 feet. So that when your dredger has finished that distance, she has still 5,000 feet to do. 5,000 feet is practically a mile, or the distance from this room to the other side of Victoria Station—that is your pipe-line to the end here. There is no possible means of filling the area from here to the other side of Victoria Station. Therefore I want to suggest to you that your scheme as a scheme broke down before it started. Do you agree with that?

A.—No.

Q.—Will you tell me why?

A.—No. I should have to think over it a great deal before I gave that answer.

Chairman.—Will you think it over, because that is a very crucial matter. I think you had better take this map and Sir Frederick had better etch this out in red and green, so as to distinguish between them, and I think you ought to give some more clear answer to this question. It is a matter of figures.

Sir Frederick Hopkinson.—It is only a matter of arithmetic.

Chairman.—It is not a matter of anything else except measurement. Apparently on your own plan Sir Frederick points out that there are many areas which are beyond the pumping area of the "Sir George Lloyd" and the "Colaba" combined, which was 10,000 feet. If that be so, he asks you whether there was not a serious miscalculation?

A—.I shall have to look up my papers. My recollection is that we had always that land booster up our sleeve.

Chairman.—I will just pass you this plan.

Sir Frederick Hopkinson.—I will put my initials on it, and then we shall know where it is.

Chairman.—You follow how the various parts begin and where the "Colaba" is?

A.—I do.

Chairman.—You see the semi-circle which marks, according to Sir Frederick, the utmost limit of the pumping capacity of the dredger and booster combined?

Sir Frederick Hopkinson.—That is their effective output.

Chairman.—It is the two pipe-lines of 5,000 feet each. Then there comes the central area, and he also points out that there is 1,700 feet not provided for. That is 1,700 feet up on the sea-wall and at the maximum depth. Then he takes the centre of the plan, and again shows you a certain area that is outside the limit of 10,000 feet, and eventually we get two blocks each of which, if the figures are right, are very seriously outside the 10,000 feet. That was the point of my question yesterday or to-day, when I asked you whether it was physically possible, with 10,000 feet of pipe-line, to pump into areas 1 or 2?

A.—Yes.

Q.—You have prepared many memoranda in this case; but would you just give us the whole story on about half a sheet of foolscap?

A.—I will see what I can do.*

Chairman.—Thank you very much.

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* See Appendix IX.

Sir Frederick Hopkinson.—Even supposing you got another 5,000 feet of pipe in order to do that, you could only do it by materially affecting the quantity of output. Is not that so? If you have your pumps double the length to pump through, they will only pump half the quantity?

A.—As a matter of fact we found out that with more than 10,000 feet the pump was pumping full bore.

Q.—That is a fallacy. You know what a pump can do. It is all horse-power. It is all work. Whatever one may think, it is bound to be a fallacy. I started the same thing in Bombay, but as soon as I came to settle down and think it out, I saw it was a fallacy.

A.—All right.

Q.—If the dredging output in the past has been in the neighbourhood of 1,000 cubic yards an hour, it follows that at the end of the extra 5,000 feet of pipe-line your output would be reduced to 500 cubic yards an hour. There are 4,500,000 cubic yards in these two blocks 1 and 2. That means something like ten years to do these two blocks —nine or ten years—which, of course, kills the scheme as a scheme.

A.—Nine or ten years to do what?

Q.—They have only been doing about 1,000,000 a year?

A.—Yes.

Q.—If you cut that down to half on account of the extra distance, it is nine years' work, taking 4,500,000 yards to do the two blocks only?

A.—You are talking of what they have done in the past?

Q.—Yes; we will have a lot of questions about that directly but we always judge people on what they do, rather than on what they say, do we not?

A.—Yes.

Q.—It is a much better way of doing it. There is one other outside point I would like to refer to before we get into the details. A question I put to Lord Lloyd has been very widely reported, in which I asked him if he really thought you had been entirely loyal. I will tell you exactly what was in my mind at the time. The first year, 1923, the working of the dredger was a failure, there is no other word for it. The second year was a worse failure. The third year was no better Having the view that I hold as to your position under which you were entirely responsible, you left Bombay on 7th January, 1925, shortly after the beginning of the working season, and you went to Australia and were entirely out of touch with the whole work until the following October; is not that so?

A.—Yes.

Q.—It seemed to me—and I generally use rather blunt language perhaps—that that was leaving them in the lurch. I may be entirely wrong, but that was my view at the time, and that was why I put the questions as I did to Lord Lloyd.

A.—Yes.

Q.—You see how my mind has worked?

A.—I see. I do not accept your view.

Q.—It depends upon the reading of that agreement?

A.—Yes. Mr. Halcrow will be giving evidence here; he will be showing exactly the amount of work that was done by him in my office while I was away in Australia.

Q.—I am very much impressed by your interview with Lord Lloyd on the 28th May, 1919, in which he said that he was relying absolutely upon you personally, and adding, quite pathetically I thought, " You will not let me down." That seemed to me to call for almost any sacrifice on your part.

A.—That was with reference to this particular report.

Q.—Was it not meaning that he was really relying entirely upon you? He was putting all his money on you, and pathetically asking you not to let him down?

A.—I repeat that was with reference to this particular report.

Q.—Was it not the scheme? Was it not by carrying out the scheme?

A.—No. There was no discussion at that time as to that.

Q.—You were appointed the Engineer?

A.—Afterwards.

Q.—But are not the two things the same?

A.—You may make what interpretation you choose of that.

Q.—The Committee will, of course.

A.—The Committee will.

Q.—I should like to run through your evidence given to the Chairman on the 28th. With regard to Mr. Kidd's estimate, which we shall come to a little later, I want to

emphasise what you said in almost the first question asked, that you had never seen more detailed information than you got in Mr. Kidd's estimate. Is not that so?

A.—No ; I do not remember that.

Chairman.—Was not that with reference to the borings only?

A.—That was with reference to the borings only.

Sir Frederick Hopkinson.—You say the borings only?

A.—Yes.

Chairman.—At present Sir George says that refers to the borings only, and that is my recollection.

A.—I am quite certain it was with reference to the borings only.

Sir Frederick Hopkinson.—I want to go through these things so that they are not omitted, and we will come to the general dredging afterwards. You said also that the staff out there were determined to dredge in the hard?

A.—Yes.

Q.—Why should they be determined to do that, to give a poor output?

A.—Well, the fact remains that they were determined so to dredge in the poor material.

Q.—But why should they?

A.—I do not know why they should ; perhaps it was easier for them.

Q.—No, it is more difficult. It is hard material and they are getting a poorer output.

A.—We are bringing evidence on that.

Q.—Never mind about that for the moment. Why should they want to show a poor output in the dredger?

A.—I have not the faintest idea ; but the fact remains that we assert positively that they insisted on taking what you might call the last ounce of it, which we criticised, and requested them to dredge in more suitable material.

Q.—Is not it the fact that at this time your dredging area had been restricted so that you had to take all the material you could get?

A.—No ; we were not obliged to go and take unsuitable material.

Q.—But you were showing in your various estimates that you were not going to have enough material to fill the reclamation after the Indian Marine had stepped in and prevented you from dredging for certain areas?

A.—No ; we showed how we could—that was Mr. Lewis showed—how we could get enough material.

Chairman.—But he showed a deficit of 7,000,000.

Sir Frederick Hopkinson.—I suggest to you that they had to dredge the whole of the material they could get near the reclamation : they had no choice in the matter?

A.—Well, I do not agree.

Q.—We shall come to the figures later on. I understand you are quite right, and it was a question of the borings?

A.—Yes.

Sir Frederick Hopkinson.—It is my note that is wrong.

Chairman.—No ; Sir George said " I had never seen a scheme with greater detailed information in respect of material." I put it to him " borings ", and he speaks of " material ", but he did not mean it in the widest sense.

Sir Frederick Hopkinson.—The one is the result of the other. You speak of the " Jinga " doing extraordinarily well and doing excellent work, and at the same time it was referred to in your report as a warning. I do not quite follow that?

A.—You will find in Mr. Kidd's evidence he talks about the wonderful work of the " Jinga ".

Q.—He had nothing to do with that work ; he was not concerned in it?

A.—No. I am talking about what Mr. Kidd said in his evidence the other day here.

Chairman.—I will summarise it. Mr. Kidd said he was in touch with Mr. Messent, and he said that the dredger people were very chary about putting the " Jinga " or " Kalu " on to anything except mud : that he persuaded Mr. Messent to try the " Jinga " in blue clay, and she did very well in blue clay, and he emphasised that. That is the only association Mr. Kidd had with it.

Sir Frederick Hopkinson.—Quite so. Did he know the output of the dredger?

Chairman.—It was 1,426—two-thirds.

Sir Frederick Hopkinson.—It is about 30 per cent. less than it ought to have done. What is the meaning of that paragraph that the dredging on the Sewri reclamation should be a warning?

A.—Well, I was examined yesterday by the Chairman on that point, and I have nothing really to add to what I said.

Q.—I shall have some further questions to ask you when I come to the dredging subject, so I will leave it for the moment. As to bonus on output, it has been given in evidence that they paid a bonus on output, and that the bonus scale was fixed by you, and nothing appreciable resulted from it. Have you ever been advised of that?

A.—No. So far as my information goes they did not adopt a bonus scheme on output.

Q.—That is what they told us?

A.—Well, I am bringing evidence on it.

Q.—I remember asking Girdwood if he had a satisfactory bonus, and he mentioned a figure. I said, " Well, that is very small, is it not? " and he said, " Well, it is acceptable," and we were told that you had laid down the scale of bonus.

A.— I would rather evidence was given on that subject by my partner.

Q.—You said also, in answer to the Chairman, that you never saw the soundings that were made after the dredger began to work?

A.—That is correct.

Q.—How could you supervise and control, or advise the Government as to the way the work was being carried out, unless you knew frequently and exactly what the dredger was doing?

A.—I was not in executive control of the work; I was only there for short periods, and I took the information that was given me.

Q.—We were told that the Government could never know until July or August what the dredger had been doing in the previous December?

A.—Yes.

Q.—I made some perhaps rather strong remarks about that, and then I was told that soundings were taken every day, reported to the office every day, and then I said at once: " Why did you not know at least every week exactly how much the dredger had done? "

A.—Yes.

Q.—How could you judge the performance of the dredger unless you knew what it was doing? You reported that the work was going on satisfactorily. How could you tell unless you had these soundings measured up?

A.—We were not in executive control, and we had a Resident Engineer there who was also Chief Engineer.

Q.—But you are personally responsible for the supervision and for the provision of the dredger. How could you tell what the dredger was doing unless you insisted on having the weekly reports?

A.—I was not in executive control of the work.

Q.—How could you advise the Government as to whether the work was going on satisfactorily or otherwise?

A.—I would advise the Government on general lines.

Q.—But general lines does not mean anything. It is purely a question of what the dredger is doing. There is nothing general about that. It is very particular indeed.

A.—Well, nobody knew what the dredger was doing.

Q.—I am asking you why you did not know. Why did not you insist upon being told; because my suggestion is that you could not supervise the works unless you did know?

A.—Very well. Then there is nothing for me to say.

Chairman.—Is not that the fact?

A.—What?

Q.—Is not it the fact that you would know as an engineer of experience that you could ascertain the work of the dredger by taking soundings of her previous work?

A.—Yes.

Q.—Mr. Lewis was your Resident Engineer?

A.—Yes.

Q.—They say that soundings came in day by day?

A.—Yes.

Sir Frederick Hopkinson.—And weekly reports were available.

Chairman.—Supposing on the 20th December, 1923, 12 days after the dredger had begun to work, you had said to Mr. Lewis, " How is the dredger working? " and he said, " I do not know," would not you, with your experience, have turned round on him and said: " You had better find out within the next two hours. Why do not you calculate your soundings? " The point Sir Frederick is trying to make is that you

could have got the information in the ordinary way in which information is obtained in these matters, namely, by a calculation of soundings, and you could from that have ascertained at once that the dredger was not giving 50 per cent. of her output. That is the point. Will you deal with that?

A.—My reply is that I was only in Bombay for limited periods, and we went on the pumping hours, not on the general results of the reclamation. There was a Chief Engineer and a Dredging Superintendent, and I went on their reports.

Sir Frederick Hopkinson.—But you did not get the results of the dredging until the following July or August?

A.—Very well.

Q.—By that time the whole season was over?

A.—Yes.

Q.—You could not make any alteration; you could not say: "You are doing badly; improve it," because you did not know?

A.—Well, I have nothing more to say on that subject.

Mr. Billimoria.—Was it not your duty to know it?

A.—I am being examined by Sir Frederick Hopkinson.

(*Adjourned for a short time.*)

Chairman.—It has occurred to me that you must be very tired. How would it do to interpose Mr. Halcrow and Mr. Settle to-morrow? We ought to be able to finish those two witnesses in the day quite easily, ought we not?

A.—I cannot tell very well. You have got the statements.

Q.—What I was thinking of was, that we might be able to manage to hear Mr. Halcrow's evidence and Mr. Settle's evidence to-morrow even if we sat rather late to do it, and then if it were necessary for you to come for a couple of hours on the next day that would give you a day's rest?

A.—Yes. I would like to consult Mr. Halcrow, but I think that would be very suitable.

Q.—Then let us leave it at that. We will try to get Mr. Halcrow and Mr. Settle finished to-morrow so that it shall not disorganise your office?

A.—I will be glad to answer the question that was put to me about the circles.

Q.—Will you please do so.

A.—Sir Frederick Hopkinson put a plan on the board with a number of circles on it, and shewed that in one case it was 1,700 feet from the 10,000 feet line to the extremity of the dredging. He said: "Does not this shew that your scheme was a failure from the beginning," or words to that effect?

Q.—That question included all the three. There are three semi-circles?

A.—Yes, there are three semi-circles. It illustrates the extraordinary difficulty of replying to technical questions by question and answer. You suddenly have a thing thrown at you that you have not considered perhaps for years and years, and it is not possible in a moment to give a reply. I would suggest with regard to questions of this kind that if Sir Frederick Hopkinson would write them down we will reply to them, but in many cases they require references to all our office plans and files, and it is hardly possible to expect answers instantaneously to questions thrown from the blue on matters of this kind. Now I will reply to this question. I have not had much time to think about it.

Q.—Why not defer your reply? You left the matter before the adjournment that you would write a short memorandum on it; why not do that?

A.—I will do that, but may I suggest that it would facilitate matters if Sir Frederick Hopkinson will put questions of this kind down on paper and let us have them.

Q.—I think we will go on as we are going and see if there is any question with regard to which you feel at a disadvantage in answering on the spur of the moment, and if that is so that shall be noted. Otherwise I think one could get along with most of the questions. There may be a question such as that, and then you shall have time to consider it. At all events, do not answer any question at all like that without giving the matter full consideration, or writing us a supplementary note, so that you shall feel that you have answered the question exactly as you would wish to have done?

A.—It is much more convenient to write a supplementary note.

Q.—Up to now the only matter outstanding is that question on your own plan. Will you write us a little note with regard to it?

A.—Yes.

Q.—That will do quite nicely. If any other questions of a highly technical and complex character arise we will adopt the same plan?

A.—It is impossible for me to remember everything that has happened in the last seven years in order to reply to technical questions.

Q.—We will get along as best we can with regard to it?

A.—Yes.

Sir H. Courthope-Munroe.—I understand that Sir George Buchanan is in a position to answer the question about the plan now.

Chairman.—No, not quite.

Witness.—We will leave it over.

Sir Frederick Hopkinson.—Of course, many of my questions arise out of answers that we have been given during the proceedings, and therefore it is impossible for me to put them down a day or two beforehand. I want to be quite sure that I properly understood you on the 25th and the 28th when you told the Chairman that you never contemplated going into Back Bay at all; is that so?

A.—On what date? I never contemplated originally going near Back Bay.

Q.—Quite. Both you and Mr. Kidd considered the question of dredging from Back Bay, and you both equally condemned it as being quite impracticable?

A.—That is correct.

Q.—And in view of the figures given us by Mr. Lewis, it would appear that you were both wrong, because he says that you can get 24 million cubic yards there?

A.—Yes, he does, but I would not say that we were wrong, because I do not admit that he was right.

Q.—You agreed with him?

A.—We agreed on borings, certainly.

Q.—You agreed it was quite impracticable?

A.—We agreed it was quite impracticable.

Q.—On account of the rocks, and various other things?

A.—Quite so. Mr. Kidd and I were in agreement.

Q.—Absolutely, and, as I say, you were both wrong, according to Mr. Lewis?

A.—According to Mr. Lewis, yes.

Chairman.—Then you go a step further, and you say: "Mr. Thomas, who took the borings and communicated them to Mr. Lewis in my belief made a series of mistakes"

A.—Yes.

Sir Frederick Hopkinson.—I am coming to that now. We have been given a list of borings at Back Bay, and it is on those borings that the "Kalu" first went there in the year 1924; on the same borings the "Kalu" went there in the succeeding year 1925-26, and on the same borings the "Kalu" is going there about now for the third consecutive season. Your intimation that these borings were all wrong is the first intimation we have had that there was anything wrong with them?

A.—Yes.

Chairman.—There is nothing that I know of on the documents that states in anyway that those borings were wrong up till now, except your own evidence.

A.—Yes. I think evidence will be given to that effect by Mr. Settle who went out.

Sir Frederick Hopkinson.—They showed us out in Bombay a large plan showing a large number of borings. I forget the number, and I forget the area, but it showed quite a large area on which they worked the dredger for the last season, and on which they propose to work it for the present season?

A.—Yes.

Q.—Of course you would never think of grounding a boat like the "Kalu" in Back Bay, would you?

A.—Not from what I know now, but on those borings, which showed soft clay——

Q.—I mean grounding it on the existing surface?

A.—That is a matter of opinion. When I saw those borings showing sand and soft clay, sand and soft clay, sand and soft clay, I did consider at one time that it might be possible to get her in and make her dig out a hole for herself.

Q.—That is what she did the first season, but that is not my question. I said would you, under any circumstances, ever think of grounding the "Kalu" in Back Bay?

A.—Grounding her?

Q.—Yes, letting her go in and take the ground, and stay there at low water every tide? It would be a very injudicious thing to do?

A.—I would not do it.

Q.—You would never think of it?

A.—No.

Q.—Nor would I. I am just running through your evidence. You said that Mr. Elgee wrote to you in July, 1924, asking if you had made arrangements for a staff for a double shift. Who made arrangements for the staff for the dredger; who engaged them?

A.—Do you mean the European staff?

Q.—The European staff?

A.—They were engaged by the High Commissioner.

Q.—Not by the Engineer?

A.—No.

Q.—Has the High Commissioner any qualifications to enable him to judge as to the capability of a dredging master?

A.—Not to my knowledge. The procedure was that the Development Directorate wrote to the High Commissioner, and the High Commissioner advertised in the papers. We were not consulted as to wages, conditions of service, and so on.

Q.—Were you not?

A.—No.

Q.—So you did not control the expenditure at all there?

A.—No. Then a small Committee was appointed of officials in the India Office to consider applications, and Mr. Settle went as an adviser to the High Commissioner's Office, and said what he thought about the people.

Q.—As a technical expert in dredging, he ought to have dominated the Committee, ought he not: in effect, he would say who ought to be appointed?

A.—I suppose he would say who ought to be appointed, yes.

Q.—I suppose if you took all the people together, and made them into one Committee, you could not find anybody in the India Office who knew about dredging, or dredging masters?

A.—No, but we were not consulted as to the terms, and the rates of pay.

Q.—Who decided what dredging masters were to be appointed; how many, and so on?

A.—That was decided in Bombay by the Government Directorate.

Q.—You appointed Mr. Brims?

A.—We nominated him.

Q.—That is practically the same thing?

A.—I was in Bombay, and I said: "You must have a separate head of the dredging. You cannot do it with anyone out here," and then we were asked, and we nominated Mr. Brims.

Q.—And also Mr. Speirs, I presume?

A.—I rather think that Mr. Speirs went out with the dredger, and remained on.

Q.—As I read it, it was more or less a matter of luck that Mr. Speirs happened to be there at the time, and he was appointed out there?

A.—He went out with the dredger, I think.

Q.—No, I think not. He went out to erect the floating pipes for Messrs Simons & Co.

A.—Not in this case, I think.

Q.—Yes, he told us that was what he went there for. He was there for some months before the dredgers?

A.—Yes.

Q.—He went there to erect the floating pipes, and as a consequence of his being there he was engaged to take charge of the dredger?

A.—You are probably correct.

Q.—Your revised estimate of the sea wall was 213 lakhs as against the original estimate of 118 lakhs. Had the sea wall been altered in character in any way to account for that difference in cost?

A.—No, I do not think it had been altered to any degree.

Q.—It had been reduced in cost?

A.—That is a question that I could not answer without consideration.

Q.—For instance, had not the concrete blocks been dispensed with?

A.—The concrete blocks had been dispensed with, yes.

Q.—I think they were estimated to cost 43 lakhs?

A.—Yes.

Q.—And some large stones were substituted which the project estimate put at about 6½ lakhs. Then was not the concrete wall reduced in thickness?

A.—I think they wanted to put solid blocks at the top of the concrete wall, and on one occasion when I was in Bombay, on my own initiative I said: "It seems a waste of money to put solid concrete. Put hollow blocks, and fill up the interstices with rubble,"

Q.—Was not it reduced in width?
A.—The first 2,000 feet was reduced in width.

Q.—Was not it reduced in height also?
A.—That I cannot say.

Q.—You may take it from me that it was. It is quite clearly in the correspondence. Therefore your original estimate, instead of being 118 lakhs, should have been 118 lakhs less about 40 lakhs, so that would bring it down to 78 lakhs?
A.—I will not argue the point.

Q.—You can take my figures.
A.—Yes.

Q.—I am quite sure of them.
A.—I will take your figures.

Q.—So that when you got this estimate of 213 lakhs, that was really multiplying the original estimate by three, approximately?
A.—Yes.

Mr. Billimoria.—The figure ought to be 200.39 lakhs. There is a misprint there.

Sir Frederick Hopkinson.—I think I took out these figures myself.

Mr. Billimoria.—If you take the total you will see that the 13 lakhs ought not to have been there.

Sir Frederick Hopkinson.—It does not make any appreciable difference.

Mr. Billimoria.—I totalled it up and found it out.

Sir Frederick Hopkinson.—(To the Witness) would you mind looking at the sample of mud that is here? That is a can of what has been called silt?
A.—Yes.

Q.—It is taken from the reclamation?
A.—Yes.

Q.—It has been called silt generally throughout the proceedings. I suggest that that is quite a wrong name, and that it ought to be mud, and mud only. You will find that there is practically no sand in it at all. You get a few grains of very, very fine sand, but quite a small percentage?
A.—Yes.

Q.—Silt, as I understand the word, means that it is largely composed of fine sand?
A.—Very often you see the expression silt and sand.

Q.—Yes, silt and sand, because silt contains sand?
A.—Pure alluvium you call sand.

Q.—Pure alluvium I should call mud, I think. That is mud, without any question?
A.—In Mesopotamia we used to call the material silt. You would call it mud, probably.

Q.—Yes. That material that you have seen there, when it has passed through two pumps, I think could only be described as dirty water, could it? When it has been agitated by two centrifugal pumps it is only dirty water?
A.—Yes, I am inclined to accept that view.

Q.—Do you think that is a suitable material for forming reclamation?
A.—Apparently they have been forming reclamation with it.

Q.—If you had seen that in September, 1919, would you have recommended the Government to use that for reclamation purposes?
A.—If I had seen that?

Q.—Yes.
A.—It is not a question to which one can reply at once, because Mr. Kidd had already stated his opinion.

Q.—I am not asking you Mr. Kidd's opinion. I am asking for your opinion?
A.—It is a very difficult question to answer right off.

Chairman.—Are you in any doubt about it?
A.—What I am thinking about are the present results.

Q.—The question that is put to you is: Suppose that had been shown to you in 1919 before you had made the Report would you have regarded that as suitable material for reclamation, or would you, in your own Report, have said that there was a very large area superimposed upon the mud which, in your opinion, was unsuitable for reclamation? That is really the question.
A.—I did regard it as suitable, because I think in my Report——

Q.—Yes, you did, but then you had not seen it. That is the point that is being put to you. Now that you have seen that material, are you of opinion that that would make good reclamation, and would you have recommended the reclamation with the knowledge

of the existence of all that mass of material that had to be dredged before you could get to the blue clay?

Sir Frederick Hopkinson.—That is the point.

Chairman.—Just think it over and tell us. Just take it quietly.

A.—Yes, I think I should have recommended it for the bottom; in fact I did recommend it as the bottom layer.

Sir Frederick Hopkinson.—Yes, I was just coming to that.

A.—With the clay superimposed upon it.

Q.—I noticed that you said that. As we saw that material out in the actual reclamation I sent a man in to go and pick me a piece of clay some fifty yards away, and to my utter astonishment he went in up to *here* (*indicating chest*).

A.—Yes.

Q.—And he struggled manfully through it, and got the piece of clay. I would like to ask you how could the clay, whether hard, stiff, or soft, that came up in lumps stay on top of that mud?

A.—The mud did harden out in time, you know. You may say that it would be the sun, but the mud hardens out like bricks.

Q.—If you spread it out in the sun?

A.—Yes, in the sun.

Q.—I can imagine that, but this was all under water?

A.—Yes.

Q.—It could never harden out unless you exposed it to the sun. What I want to know is how possibly could the clay float on that mud?

A.—If you put it in that way I see the difficulty.

Q.—I could not understand it, because I do not see how clay cut out in pieces, as it would be by that cutter, could ever stay on top of that mud. That material, after it had been churned by two centrifugal pumps and then deposited into water, escaped through the rubble mound. Of course it escaped. There was nothing to stop it escaping?

A.—There was nothing to stop it escaping.

Q.—It was bound to escape?

A.—Yes.

Q.—And I gathered from both Mr. Brims and Sir Lawless Hepper that you apparently did not wish to retain it as you thought it was not worth retaining. A very large quantity escaped in the first two seasons dredging?

A.—Yes.

Sir M. Visvesvaraya.—900,000 cubic yards.

Sir Frederick Hopkinson.—I do not think it was as much as that. It was 45 per cent. of the output.

Chairman.—It was 45 per cent. in one year and 55 per cent. in the other year.

Sir Frederick Hopkinson.—That would be nearly a million yards in two seasons. That was half the season's work.

A.—In point of fact a great deal of that mud has dried out and has made good land.

Q.—On the other hand a great deal of it has escaped.

A.—A great deal of it has escaped.

Chairman.—Taking the two years it is 50 per cent. It is 45 per cent. in one year. and 55 per cent. in the other.

Sir M. Visvesvaraya.—How many cubic yards is that?

Sir Frederick Hopkinson.—That is roughly one million cubic yards.

Sir M. Visvesvaraya.—It is nine lakhs of cubic yards.

Sir Frederick Hopkinson.—It is 900,000 cubic yards. That in two seasons is one-twenty-fifth of the whole dredging operations, but they told us quite definitely that you did not apparently wish to retain this, and you took no steps to retain it?

A.—No, that is not correct. When I said it was not worth while retaining there was very little of that material at all.

Q.—But I suggest to you that your first year or two's dredging was almost entirely mud?

A.—No.

Q.—Are you sure?

A.—Quite sure.

Q.—This is a copy of the plan that you sent out to Bombay, and you began operations in block K?

A.—Yes.

Q.—In block K there were 2,281,000 yards of material of which the clay was none?

A.—Yes.

Q.—That is where you began dredging?

A.—Yes.

Q.—In block B there were 1,578,000 yards of mud and no clay. In block J there were 893,000 yards of mud and 646,000 yards of clay?

A.—Yes.

Q.—In block H there were 4,189,000 yards of mud and 300,000 yards of clay. Altogether was about one million yards of clay to 9 million yards of mud?

A.—Yes.

Q.—Therefore I suggest that you could not have had much clay in the first two seasons dredging.

A.—In point of fact there was a considerable amount of clay.

Q.—It is not shown in the borings, is it?

A.—It is not shown in those borings.

Q.—It is not shown in those very complete borings which were made. I do not see how you could possibly have had any clay in the first two seasons unless you went right to the outside edge?

A.—A great deal of that material was really hardening out very well in various parts of the Reclamation.

Q.—But it was all under water. It could not harden out. It was impossible for it to harden?

A.—Were you there in the hot weather?

Q.—I was not there at all in those years. The material was covered by the tide every day, and it was also held in by a bund, and all the water coming into the pipe kept it absolutely wet. It was never exposed to the sun: it was always covered with water.

A.—It was always covered with water?

Q.—Yes?

A.—Mr. Settle, who is giving evidence, went very particularly into the question of material. He was there much later than I was, and I should like you to ask him.

Q.—We shall be glad to have any information that we can get, and I hope that he hears the questions so that he can carefully consider them and give us the proper answers. Do you remember that in your estimate of September, 1919, you provided for backing up the sea wall with moorum?

A.—No.

Q.—If you will look at your original report I think that you did?

A.—Yes.

Q.—Why was not that put in?

A.—It is not very much, is it?

Q.—It is not very much I agree; it is not nearly enough. It is item No. 8 on page 29. In your comparative estimate on page 13 you mix the two up together. You call it moorum backing and topping 1,919,000 yards?

A.—Yes.

Q.—The general quantity for one foot of moorum I think was 1,860,000 yards, was it not?

A.—There have been various numbers, yes.

Q.—I think it only varied between that and double that quantity?

A.—Yes.

Q.—That leaves about 59,000 yards for moorum backing?

A.—Yes.

Q.—That would not be enough to back up the wall, would it?

A.—That would not be enough to back up the whole of the wall.

Q.—No?

A.—It was what we considered necessary in this preliminary estimate.

Q.—Wherever you were pumping mud it was necessary, was it not, because that mud churned up by two pumps would flow wherever water would flow, and as the tide went out it was bound to go out with it?

A.—As you probably noticed, in one of my reports I say it might be necessary to make settling ponds.

Q.—Yes, and that is what was done under Sir Lawless Hepper's orders?
A.—Yes.

Q.—Then in November, 1925, your firm wrote out to say that the necessity for doing this appeared to be indicated?
A.—Yes.

Q.—That was two years after the dredging had begun, and nearly a year after the wall had been closed with moorum?
A.—Yes.

Q.—Why did they say that? Can you give me any idea? It was eighteen months after it was first suggested. It took eighteen months for somebody in your office to find out that it was indicated and that it might be necessary?
A.—Yes. Mr. Halcrow can give evidence on that very point.

Q.—Put yourself in the position of the man in charge out in Bombay, what do you think he would think of an engineer in London writing such a letter as that in October, 1925. Do you think he would have any respect for him?
A.—I cannot reply to the question. I think that you would require to know all the circumstances.

Q.—The circumstances are very simple.
A.—They are not so simple.

Q.—They are quite simple?
A.—No.

Q.—Here you were pumping material into a lagoon which was escaping through a wall that you had built. You could not have anything simpler. The question is to put a cork in the hole and stop it?
A.—I do not agree with you in your remark as to what the engineers would think about the engineer at home.

Q.—I will tell you frankly that I know what I should think?
A.—You must remember that we were in the extraordinary position of having a representative who was not a representative. You know perfectly well that if work had been undertaken by contract, and we had had a resident engineer in the ordinary course of things looking after their interests many things would have been done differently.

Q.—I hope so any way.
A.—We had a resident engineer who was not—well, I need not say any more. He broke down absolutely.

Q.—As you have mentioned the subject I will refer to it here. Do you really think that Mr. Lewis was ever, whatever his health was, capable of tackling a job of that magnitude? Was his past experience such as to warrant his ever being appointed to take charge of that work?

Chairman.—Had he the energy and drive to do it?

Sir Frederick Hopkinson.—I will ask that question later. Had he the necessary experience, first of all?
A.—Yes, I think he had the necessary experience.

Sir Frederick Hopkinson.—I have asked Mr. Lewis very complete questions about the whole of his career, and it does not appear to me that anybody could, under any circumstances, have been warranted in placing him in charge of such a large and important work.

Chairman.—Sir George, do tell us anything you can about this, because this is a matter in which I think we feel a good deal of seriousness—the appointment of Mr. Lewis. We have seen Mr. Lewis here.
A.—I am sorry you did not see him in a condition of good health. Originally I had another officer under contemplation. He failed me. The Governor said: "We must start work." I searched round. It was very difficult indeed to get men at that time.

Sir Frederick Hopkinson.—Nobody knows that better than I do.
A.—I nominated Mr. Lewis, and naturally I should not have nominated him unless I thought he was up to the job. He had done most extraordinarily good work with me in Burma, opening out large quarries, which was what we wanted him for first of all.

Q.—In Burma?
A.—Yes.

Q.—What was that work?
A.—The River Training works.

Q.—Do you mean Rangoon?

A.—Rangoon. He had entire charge of the quarries. They were large quarries. I think we had 1,000 tons a day.

Q.—That was only an offshoot of the thing in Bombay. In Rangoon he said all he had to do was to look after that quarry.

A.—I think he had more than that to do. He had quite a distinguished record.

Sir M. Visvesvaraya.—He was quite a different man when I met him in Bombay, Sir Frederick.

Sir Frederick Hopkinson.—I am not saying anything about his physical capacity. I am speaking of his experience of large works. With the exception of Rangoon, which appears to be only working a quarry, I do not remember any experience which he gave us which was of any size at all.

A.—In point of fact, he had rather a distinguished record in the Public Works Department. When I nominated him for this position he was chief engineer to the whole of the province of Burma. You cannot be chief engineer to the whole of the province of Burma without some experience.

Q.—That is not quite my point. My point is experience of, and managing, a large work of this kind?

A.—He had had practical experience. I cannot remember the whole of his record. Have you seen all his record, chapter and verse?

Q.— We have got it.

A.—Or have you only got what he has said here?

Q.—I asked him complete questions about it, and he never seemed to have been in any position for more than a few months, and they were all comparatively small works. I suggest to you that, for properly carrying on this work, you ought to have had the best man obtainable in the world, because there are very diverse propositions in it. You agree with that?

A.—I agree with that.

Q.—And it would probably have paid you over and over again if you had given £10,000 a year to the man who was best capable of doing it?

A.—Excuse me, it was for the Government of Bombay to say what they would give?

Q.—No, I do not think I can agree with you there. I think you were in the position at that time of adviser to the Government of Bombay, and it was for you to say to them what they ought to do. Who is there in the Government of Bombay who can decide on the capacity of a man for carrying out a work of this kind? Is there anybody?

A.—It is not a matter of the Government of Bombay. It goes to the Government of India.

Q.—Go to the Government of India if you like.

A.—However, I can assure you, Sir Frederick, that you would not have had the very slightest chance of getting a man at—I will not say £20,000 a year.

Q.—£20,000 is rather a large sum?

A.—Say £5,000 a year. I do not want to say anything against Mr. Lewis. I know him much better than you do.

Q.—Quite; I understand your feelings.

A.—He has great powers of organisation. You saw a wreck. You did not see the real man.

Q.—I am not saying anything against Mr. Lewis personally.

A.—When I proposed a salary for him—I forget what the exact salary was?

Q.—Rs. 3,000 a month.

A.—It was objected to. It had to go home to the Secretary of State for sanction, and then it was objected to, and at the last moment I had to write to Sir George Lloyd and say, " I do not know what we are going to do; I have got this one man, and the Secretary of State has refused to sanction him at Rs. 3,000 a month."

Q.—At certain times we all know quite well that Governments are always penny wise and pound foolish, are they not?

A.—I agree.

Q.—In other words, if you want a good thing you have to pay for it?

A.—Yes.

Q.—To go to another subject, you said it was cheaper to begin the sea wall from the Marine Lines end. I wish you would tell me why you thought that?

A.—For the simple reason that the railway from the quarry led straight on to the Marine Lines work.

Q.—But you only had to extend your railway to the Colaba end, as you did afterwards?

A.—What did the Colaba railway cost—7 lakhs of rupees.

Q.—But you had to do it?

A.—We should not have had to do it if we had gone the whole way from the Marine Lines.

Q.—It was necessary to do it. How are you going to build the first 2,000 feet at the Colaba end?

A.—With regard to the first 2,000 feet, we did get a great deal of stone thereabout, it was concrete.

Q.—But 2,000 feet of wall means very large quantities, and surely you could not economically get that in penny numbers? You want to do the thing properly. In any case, you would have to take the railway there some time in order to take your moorum topping, would you not?

A.—Well, there again, one is going over years. We might have been right or we might have been wrong, but, at all events, we considered it was best to begin at the Marine Lines end.

Q.—I suggest that that was quite wrong. I suggest that the advice that you ought to have given to the Government of Bombay was "At any cost begin work at the Colaba end; finish that Block 8. Then immediately you have finished it (it required no development) hand it over to the Government of India for their military use," and they would pay you two-thirds of your total estimate for doing the entire work, and those two-thirds would have financed your scheme entirely.

A.—Well, it may be so. One can always be wise after the event.

Q.—But is not that rather elementary? The first thing you do when you are thinking of carrying out a large work, is to say to yourself "How am I going to finance this?" You were spending £1,250,000. At 6¼ per cent. that cost you nearly £100,000 a year?

A.—I was not financing it. It was the Director of Development who was financing it.

Q.—You were the adviser to the Government?

A.—I was not an adviser on financial matters.

Q.—But you do not need to be an adviser on financial matters. That is the ordinary business way of doing a thing. Surely the question of 6¼ per cent. interest on £1,250,000 should weigh very largely with you in determining how to do the work, should it not?

A.—However, take it as you like. We decided it would be better to start from the Marine Lines because it was near the quarries. The Government asked us to begin at both ends, and you know the events which followed. Whether we were right or whether we were wrong is a matter of opinion. I say one can always be wise after the event.

Q.—The wise man is a man who is always wise before the event, is he not?

A.—Unfortunately they are very rare in this world.

Q.—Do you not find that all successful business men are wise before the event rather than afterwards?

A.—I could not say; I do not know.

Q.—It is the men who are unwise before the event who end up in the Bankruptcy Court. I suggest to you that you gave them thoroughly bad advice in advising them to begin at the Marine Lines end, for the reason I have given to you, if for no other. You are spending nearly £100,000 a year in interest—which you are spending to-day, and which you have been spending every day since you have started the work at the Colaba end. I should just like to run through your statement. There are a few points in it which the Chairman has not thoroughly dealt with, from my point of view. First of all I would like to ask you one or two questions about your earliest connection with the work. It would appear that you arrived in Bombay on the 19th May, and you left on the 31st. That gave you about ten working days?

A.—Yes.

Q.—Do you think that anyone could do justice to such a scheme as this in ten days?

A.—I undoubtedly do. I should not have thought of leaving otherwise.

Q.—Did you select a quarry in those ten days?

A.—No. I made enquiries about a quarry, but look at my terms of reference? I was not asked to select a quarry.

Q.—"To examine and report on Mr. Kidd's estimate." How could you do it?

A.—Very well, Sir Frederick Hopkinson. I had the whole of Mr. Kidd's plans and estimates. I obtained the local information I required in Bombay, and I still maintain

(it is a matter of opinion; I have my opinion and you have your opinion) that I had sufficient time for the work. I should not have gone away if I thought I had not got all the information.

Q.—I do not personally see how you could possibly make up an estimate for doing the work unless you had settled where the quarry was to be. You did not know how far it was going to be away. You did not know what the railway rate was going to be. You did not know how much it would cost to open it up. You did not know what length of roads you would require.

A.—I think we are confusing issues, Sir Frederick. I was not making out a working estimate then at all. I got my information as to what the ordinary price of stone was, but I was not going into the details of a quarry.

Q.—But the price of stone depends upon the conditions, does it not? I saw some prices in your list of estimates which you gave me yesterday. It might have been in cart loads. You had to start an entirely new and large scheme. I do not see how you could possibly fix a price for your sea wall unless you knew where the stone was coming from and what it was going to cost you?

A.—Did you ever know the late Mr. C. S. Meik?

Q.—Quite well.

A.—Do you think he would have assisted in preparing an estimate that was not safe about the prices?

Q.—I never knew him in any estimating capacity, so I could not possibly say, but I do not see how Mr. Meik, in London, could possibly know what it was going to cost in Bombay. It was for you to do, really, was it not, and not Mr. Meik? You had been on the site. At any rate, I suggest that ten days was an utterly disproportionate time to allow for the approval of such a scheme as that.

A.—I wish it to be put on record that that is a matter of opinion, and that I dissent —that I consider that I had ample time.

Sir Frederick Hopkinson.—I do not think I need say anything more about Mr. Kidd's estimate. You have done that pretty thoroughly, I think, Mr. Chairman? As to your original appointment, Sir George, Lord Lloyd told us the other day that he had not previously known you. Is that so?

Chairman.—He had met you for a few moments in Mesopotamia, just socially?

A.—Well, we had a long talk of perhaps an hour or two in Mesopotamia.

Sir Frederick Hopkinson.—But not about technical matters, I presume? It would appear that your appointment to undertake this work depended upon the fact that you happened to be in India at that particular time?

A.—That is for you to say.

Q.—Lord Lloyd had been telegraphing home to know if they could send an expert out, and because they said they could not send one out before October he decided to use your services. Is not that it?

A.—With the consent of the Government of India.

Q.—So I say it depended upon the fact that you happened to be out there at that particular time?

A.—That is one way of putting it.

Chairman.—Lord Lloyd also said that your selection was fairly obvious.

Sir Frederick Hopkinson.—On Page 32 of your report, the 6th line from the top, you say "We recognised at once that the crux of the scheme lay in the efficiency of the dredging plant and success of the dredging operations, and on these matters we concentrated our attention. We had both had great practical experience with dredgers of all types and in dredging." As you recognised that the crux of the scheme lay in the efficiency of the dredging plant, you would, of course, take exceptional means to satisfy yourselves that the plant you proposed would be suitable for the work?

A.—Yes.

Q.—Broadly, without going into any details, the machines you have supplied have done half of what you estimated they would do?

A.—Yes.

Q.—You mention further down on the same page about the Rangoon river training scheme. There was a lot of dredging there, was there not?

A.—There was.

Q.—Can you tell me at what cost?

A.—No, I cannot.

Q.—I will tell you then. It cost 1s. 6d. a cubic yard.

A.—I have not the figures before me, but I told the Chairman that in all these matters the circumstances surrounding had to be considered.

Q.—The material at Rangoon was light sand—ideal dredging material, much easier to do than that of Bombay, I think, was it not?

A.—It was silt and sand.

Q.—In fact material for which suction dredgers were first invented to deal with?

A.—Yes.

Q.—The cost I have taken from a paper read by you at the Institution of Civil Engineers. I want to know how, with that record so near you, you could ever conceive of doing this work for eight annas per cubic yard?

A.—It is not a question I can possibly answer without reference to the paper quoted.

Q.—Did not that price influence you in fixing your price of eight annas?

A.—I cannot answer any of these questions by question and answer. I cannot go over what happened in Rangoon in 1912 without referring to my figures.

Chairman.—You can tell us this, Sir George. You must have had in your mind, when you were drafting the report of 1919, that Rangoon had cost 1s. 6d. a cubic yard, must you not? You would carry that in your mind?

A.—Possibly.

Q.—Certainly. A material matter like that would not pass out of your mind?

A.—No.

Q.—You must also have had it in mind that it was silt and sand—the material on which you were working in Rangoon?

A.—Yes.

Q.—Did it never occur to you, when you were drafting your report and knew you were going into a material of silt and blue clay, to consider whether you would do better in silt and blue clay than in silt and sand? Silt and sand is an easier operation than silt and blue clay, is it not?

A.—Yes.

Q.—If it cost you 1s. 6d. to do silt and sand, presumably it would cost you more than 1s. 6d. to do silt and blue clay. Did that point of view ever occur to you?

A.—It may have occurred to me, but one must consider all the circumstances. I cannot answer questions of this character.

Sir Frederick Hopkinson.—The circumstances at Bombay were so different that you required two dredgers to do the same work, and therefore your cost would be very nearly double, would it not?

A.—Yes.

Q.—You had only one at Rangoon, and if I remember rightly, the horse power of your dredger at Rangoon was about 3700. Moreover it was a double stage pump; that is, there were two pumps on the one boat?

A.—Yes.

Q.—That is a much more efficient tool, is it not, than a single pump?

A.—I am not prepared to answer any of these questions.

Q.—That is an ordinary matter of ordinary technical knowledge?

A.—No.

Q.—You claim to be an expert in dredging?

A.—Rangoon has gone out of my knowledge.

Q.—Leave Rangoon alone. You claim to be an expert in dredging. Is not a double stage pump far superior to a single stage pump?

A.—Of course it is.

Q.—That is the point. Then why did you put a single stage pump at Bombay?

A.—Why did I put a single stage pump at Bombay?

Q.—Yes, a single stage pump on each boat?

A.—That I certainly cannot answer by question and answer.

Q.—The "Sir George Lloyd" and the "Colaba" each had one pump, but the "Pelican" at Rangoon had two pumps, double stage?

A.—Yes.

Q.—You say it is a much more efficient tool, and I entirely agree with you, and yet you put a single stage pump into the Bombay machines?

A.—I am not prepared to answer that question. We did not design the dredger in Rangoon and we did not design the dredger for Bombay.

Q.—But you gave the specification for the dredger at Bombay?

A.—We gave a skeleton specification. We did not say what the pump was to be.

Q.—Then what is your specification worth, because that is the heart of the machine?

A.—We asked the builders to specify the best for the work.

Q.—Then you did not make the specification. The builders did it?
A.—The builders did the specification.

Q.—You have claimed hitherto that you drew up the specification for the pump for the " Sir George Lloyd "?
A.—No, I have never claimed that.

Sir Frederick Hopkinson.—I think you have—jointly with Sir John Biles. It appears in your statement.

Chairman.—The witness referred to a letter of September 12th. You are referring to the letter of September 12th of Simons & Co., are you not, in which Simons gave you a general specification with certain modifications after discussion between Sir John Biles and yourself which formed the basis of the contract?
A.—Yes.

Q.—The letter of September 12th, 1919, is the first document in which anything like a general description of the vessels is given?
A.—That is correct.

Q.—And that was drawn up by Messrs. Simons & Co.?
A.—That is right.

Sir Frederick Hopkinson.—But we have been told that you made the preliminary specification for that dredger. You would tell Messrs. Simons before that, would you not, what they had to provide for? Did you not say it must pump 2,000 yards an hour?
A.—Yes.

Q.—Did you not give them the length of the pipe?
A.—Yes.

Q.—Did you not give them the height to which they were to pump?
A.—Yes.

Q.—That is all you gave them?
A.—That is all we gave them.

Q.—And for that you received 1 per cent.?
A.—I beg your pardon.

Q.—For that you received 1 per cent. of its cost?
A.—We have not received one per cent. of the cost.

Q.—You have hopes I expect?
A.—No, I have not.

Chairman.—You have received ¾ per cent.

Sir Frederick Hopkinson.—And the other is owing.

Chairman.—Also, Sir George, you had various consultations with Sir John Biles and other people, apart from these one or two interviews with Simons before July, 1925?
A.—Yes. Put it in this way. We were to get so much on the whole work. Very well then. There was a discussion as to how that was to be arrived at, and it was decided that we should have so much of the dredger as part of the whole work, and Sir John Biles drew up the specification. I think he showed it to us. I do not know when, but we considered he was responsible for the specification.

Sir Frederick Hopkinson.—What I am trying to find out is who is actually responsible for the original specification for the dredger, and why the dredger was built with a single pump.
A.—The reply to that is that the original specification was drawn up by Messrs. Simons & Co. in the usual way.

Q.—Then they practically dictated what kind of a dredger you were to have?
A.—Yes.

Q.—And the dredger they specified was almost a copy of the " Kalu " and " Jinga " in all the essentials?
A.—In all the essentials.

Q.—It was a little bit bigger?
A.—Yes.

Q.—And had a little bit more power?
A.—Yes.

Q.—One was 2,700 h.p. and the other was 3,000 h.p.?
A.—Something like that.

Q.—One had to dredge a shorter distance than the other, and a lower elevation, but in essentials they were copies. Now we know as a matter of fact that both the " Kalu " and the " Jinga " were failures at Sewri. Together they did a little more thar 50 per cent. of what they were designed to do?
A.—We have already discussed that very considerably with the Chairman.

Q.—I know, but I wish to emphasise the point that although you know a double stage pump was more efficient than a single stage pump, you allowed them to specify a single stage pump?

A.—Yes, and if I may justify that I will do so in a separate communication.*

Sir Frederick Hopkinson.—We shall be only too glad, Sir George.

Chairman.—Just make a note of that will you, Sir George?

Sir Frederick Hopkinson.—Do you remember in this connection that the dredger specified by Lobnitz & Co. for doing the Bombay work was a double stage pump?

A.—No, I do not remember.

Q.—Well, it was. If this large and important scheme was almost entirely a question of the dredging, do you not think it would have been fair to the dredger builders to have made certain that they had a sample of the material—the clay—which they had to dredge in order that they might design a dredger best capable of dealing with that material?

A.—No, I do not admit that.

Q.—What do you think was the proper way of asking them to design a dredger? Surely you must give them some indication of what the machine is to do?

A.—We are getting back to the old question of stiff clay and unctuous clay and soft clay.

Q.—I am taking it in rather a general way. I am suggesting that, both for your own protection and for the protection of the dredger builders, they ought to have been given a sample of the exact material with which the machine they had to design had to deal. Do you not think that would have been the proper thing to do?

A.—All I can say is that I have never done such a thing, and I do not know of any case where it has been done.

Q.—I advisedly put in the words " for their own protection " because you see the position now. It has been advertised to the world that this dredger has not been successful. That is bound to reflect in some way upon the dredger builders, is it not?

A.—Well, it has been advertised to the world that the dredger is not successful, but there will also be presumably advertised to the world the other side of the question—that the dredger has not been worked properly.

Q.—We will deal with that in more detail when I come to dredging. I am only trying to clear up a few points in this volume. There is one thing which I do not quite understand here. At the top of Page 37 you say " I modified and very considerably cheapened a section of the wall proposed by Mr. Kidd for reasons given in my report "?

A.—Yes.

Q.—Would you mind explaining to me how that can be, when Mr. Kidd's wall was going to be built for 64 lakhs and yours was to cost 118?

A.—That is very obvious.

Q.—It may be to you, but it is not to me, and I hope you will make it so.

A.—This is all I have to say on the subject. Mr. Kidd's estimate of 1912—sea wall, 64·22 lakhs. My estimate at the same time of Mr. Kidd's plans, 56. My estimate for a sea wall—which, as I say, was cheaper than Mr. Kidd's sea wall, in 1919, which is seven years later, 118·7.

Q.—Twice as much as Mr. Kidd's?

A.—Yes.

Q.—I do not quite see how you very considerably cheapened it?

A.—If I had Mr. Kidd's plans here I could show you, but really I cannot show you without Mr. Kidd's plans.

Q.—Well, I have not got them. Now if you will turn to Page 38, you give the order in which you suggested the work should be done: No. 1, order dredging plant; No. 2, order railway tipping wagons; No. 3, open up quarries for stone and murum; No. 4, begin building wall from Colaba end?

A.—Yes.

Q.—There is not a word there about beginning from Marine Lines, is there?

A.—No, not a word.

Q.—Is that because the Government instructed you afterwards to begin from Marine Lines?

A.—No. It was because at a later date we considered that transport conditions would be easier at Marine Lines.

Q.—I suggest to you that that order is quite wrong; that you ought to have been ready for the dredgers before they arrived there. Your dredger, when you let the contract, was promised to be finished in 14 months?

A.—Yes.

Q.—Probably if you had gone to a little expense and paid for a little overtime you could have got it done in ten or eleven months, or even twelve. Allow two months

* See Appendix XVI.

for the voyage out there. That meant 14 months. Was it possible for you, from May, 1920, to be ready to start dredging in July, 1921? Could it ever have been possible?

A.—It was hoped to be possible.

Q.—I want to go further than that. I want to know, could it by any possibility have been ready, because you did not order your plant till about October, 1920, and the bulk of it was not delivered until 1922. How could you have been ready for the dredger in July, 1921? You have got to order your plant, get it out there, open up your quarries, lay all your railways in, get your plant erected, build your sea wall, build your cross wall, and be ready for the dredger to start, and the storm water drain if necessary—and which was necessary in Block 8. I suggest that the order is entirely wrong and that you ought to have held your hand about the dredger?

A.—Dredgers sometimes sink, and then you have to order another one.

Q.—It is insured, is it not, so you do not lose anything except time; but you surely did not lay down this order of doing the work on the presumption that the dredger was going to sink? Surely that would not have influenced you?

A.—I wish to point out, Mr. Chairman, that these are all expressions of opinion. Sir Frederick Hopkinson can have his opinion: I can have my opinion. I have no doubt that we could both call in experts who would also express opinions. I am willing to leave it at that. If Sir Frederick Hopkinson differs from me, naturally he will put down that he differs from me, and we will agree to differ.

Chairman.—That is right. As long as you give your explanation in answer to Sir Frederick's question, we shall then know just where we stand.

A.—I do not accept always what he says. I say that this is a matter on which we could both of us bring experts to consider and decide.

Sir Frederick Hopkinson.—It meant that you would have to order your plant in October, 1920, get it delivered in Bombay and erected, and have your quarries opened, and be all ready in eight months. Do you consider that a feasible thing?

A.—Not in eight months.

Q.—Yes, in eight months—from October, 1920 to July, 1921, nine months. We need not go on opinions at all. Going on the facts, when did your plant get out there for opening up the quarry? It was towards the end of 1922.

A.—You forget, Sir Frederick, that that was on the assumption that a contract was going to be let in Bombay in October, 1920, and the work was going to be taken in hand at once.

Q.—You mean the first piece of wall at the Colaba end?

A.—Yes.

Q.—You were going to do 700,000 yards of dredging in 17 days? That was only providing for 17 days' work for the dredger. There are 2,000 feet of wall at the Colaba end?

A.—Oh, no; we had hoped to do more than that.

Q.—But that is what you say now—that this was on the assumption that you were going to get 2,000 feet of wall built by contract? Now, on page 39 you say: "The Development Directorate had not been created, and I understood my firm would be in sole charge and control, and that our resident engineer would be free from the numerous restrictions," and so on?

A.—Yes.

Q.—I am only pointing this out in order that your Counsel may consider this as one of the points. What correspondence has ever taken place since that has altered the impression you had at that time that you were to be in sole charge and control? It is control, if you observe, not supervisory control, but control.

A.—At that date we had no agreement. We had not been appointed engineers to the work. At that date no Development Directorate had been created. I do not see that the matter applies; but that is a matter my Counsel will deal with.

Q.—I hope he will; but that is what you had in your mind at that time: that you were to be in sole charge and control. That meant in executive control, did it not?

A.—At that time I supposed the staff of engineers would be appointed independently of the Development Directorate.

Q.—But you were put in sole charge and control?

A.—I was not in sole charge and control.

Q.—My question was: What has taken place since that has altered the view that you expressed there?

A.—Well, many things have happened. However, that I prefer to leave over. It must be common sense that one cannot be in charge and control if actually all power is elsewhere.

Q.—I entirely agree. If you are going to be in sole charge and control you must have both powers?

A.—Yes.

Q.—Otherwise you cannot remain in full charge and control?

A.—No.

Q.—The delay I am causing is entirely to be attributed to the Chairman. He has taken so much of the wind out of my sails that I have to find what he has not touched upon. There is one point I would like to emphasise a little on page 50, where you say :" I had agreed on behalf of my firm, and had promised to make the carrying out of the work my principal object; if necessary, to decline works elsewhere, and I had agreed to go out and spend several months every winter in Bombay." I should like to contrast that with the year 1925, when you left Bombay on the 7th January and did not return again. You went out of touch with the works?

A.—What time did I arrive in Bombay in that year?

Chairman.—The 24th November, 1924.

A.—I think it was October.

Chairman.—Yes; it was October, 1924.

Sir Frederick Hopkinson.—That is about two and a-half months?

A.—Yes.

Q.—As you yourself have said, questions were always arising, and you were not in a position to deal with any questions which arose after 7th January, which was the bulk of the working season—from then on to May or June?

A.—They were most admirably dealt with in my office.

Q.—Possibly; but the point I am trying to make is that you had made this your personal care, not your office, and sometimes there is a good deal of difference in that.

A.—It is curious they were always so very pleased to say good-bye to me in Bombay, is it not, and they never asked me to remain?

Q.—It is not very flattering?

A.—It is in one way.

Q.—I should like them to say good-bye to me with regrets.

A.—Yes.

Q.—Then on page 53 : " I also said I was not aware of any other case where the execution of the work had been specially confined to the personal attention of one particular member of a firm."

A.—Yes.

Q.—That is another thing?

A.—Yes.

Q.—Then three lines further on you say : " But the one of my personal attention was retained." I am simply emphasising what Lord Lloyd said to you in 1919 : that he trusted you entirely not to let him down.

A.—Yes.

Q.—There is one point I want to mention about costs. I have read all the correspondence about the costs that took place between the Director of Development and the Government. That was a case where the Government showed very great stupidity in resisting the appointment of a proper staff to keep costs; but the point I want to make is this : You agree you were in general supervision of the works. Is not that so?

A.—Supervision of the permanent works—advisory.

Q.—I mean permanent works.

A.—Yes.

Q.—I want to suggest to you it was not possible for you or anybody else properly to supervise the works unless you knew the costs.

A.—I quite agree.

Q.—It is an essential factor in the management and supervision of works, is it not?

A.—Absolutely essential.

Q.—And that not knowing these costs you could not possibly supervise them properly?

A.—I agree. You perhaps understand the procedure in India with public works, which is that they do not keep detailed costs.

Q.—I should think that is probably a very serious blot upon their control of works.

A.—I have always thought so.

Q.—I entirely agree with you.

A.—A project estimate is prepared and sanctioned. The estimate has so many heads. The only concern of the auditors is that nobody steals a rupee, and that the sanctioned estimate under the various heads is not exceeded; regardless of the fact

that by keeping costs properly and exercising economy expenditure can be very much reduced.

Q.—Keeping costs enables you to exercise economy?

A.—Keeping costs enables you to exercise economy, but the fact that the cost of public works might thereby be very much reduced does not come within the purview of the audit.

Q.—Then you come to the question of who makes these project estimates. It seems to me rather a comic-opera performance, because the man who makes the project estimate is the man who is going to carry out the work.

A.—That is true.

Q.—Therefore, he would be more than human if he cut his prices down.

A.—Exactly; I agree.

Q.—If he cut his prices down and the work cost a little more than his estimate showed, he would get into serious trouble?

A.—He would.

Q.—If he put his prices twice as much as he need and he did it for three-quarters, he would be considered more or less a reliable man?

A.—I quite agree.

Q.—Although the work might have cost 50 per cent. more than it ought to have cost?

A.—Yes.

Sir Frederick Hopkinson.—I am glad we agree on something.

Mr. Billimoria.—It is lamentable that in spite of the project estimate being excessive we have not been able to do anything even within the project estimate, as far as this scheme is concerned.

Sir Frederick Hopkinson.—We are only keeping within the one principle at the moment.

Mr. Billimoria.—The 702 lakhs estimate has been far exceeded.

Sir Frederick Hopkinson.—I should not like to be led into making any remarks about the efficiency of the audit in your presence, Mr. Billimoria. Then you complain here, and very rightly complain: "At no stage were we informed what the work was costing." My suggestion is that you could not possibly, without that information, supervise the works.

A.—We are in agreement.

Q.—Therefore I should go a step further and say: Why did you not insist upon having the costings? Why did you not write to the Governor-General and say: "If you do not do this I cannot possibly supervise the works. I cannot carry out my contract with you properly to supervise the works unless you help me"? It would be a quite sufficient reason for a threat of resignation, I think. Do you not think so?

A.—I think we discussed this this morning:

Chairman.—Is it not quicker to say yes or no whether, in those circumstances, you ought not to have made strong representations right up to the Governor and direct even to the Government of India? That is Sir Frederick Hopkinson's point.

A.—It went to the Government of India.

Q.—It went by easy stages to the Government of India. It is the same point that Sir M. Visvesvaraya was putting: that direct personal representations by you would have much more effect than sending a letter to Mr. Lewis which, in the ordinary routine, eventually finds its way to Simla.

A.—I do not agree, because Government does not understand what costing accounts are. They looked upon my proposals with surprise. They said: "We do not understand this. What is this about cost accounts?"

Sir Frederick Hopkinson.—Then is not it your duty to make them understand, and tell them you cannot possibly carry out your contract unless you have these? I should have thought it would be. You say on page 64 that you sent out Mr. Settle to report on the dredging, to criticise the execution of the works, and make a thorough inspection of the works?

A.—Yes.

Q.—Did he make a report?

A.—He did make a report.

Q.—To whom?

A.—To us.

Q.—What action was taken on it?

A.—By that time we had ceased to have any connection with the works.

Q.—On page 70 you speak about savings on the estimates other than those connected with dredging as amounting to something like 35 lakhs of rupees. I suggest to you that was entirely due to the alteration in design, and to the omission of the concrete blocks; so there is no particular credit attaching to anybody about that.

A.—The omission of the concrete blocks is a saving, is it not?

Q.—Yes; but it is a saving in the cost.

A.—I do not for a moment say that the saving was in execution.

Q.—I see. It was an omission. It was something which you did not find necessary?

A.—Yes.

Q.—So you very properly omitted them. Then you say on page 82 that the chief engineer, for all reclamation schemes, was under the direct orders of the Director of Development: "But as far as the Back Bay scheme was concerned he also had duties to my firm." Was not he almost entirely responsible to you, to advise you as to what went on in your absence?

A.—Well, really he was supposed to carry out the duties of a resident engineer.

Q.—Normally, if a man did not carry out his duties you would dispense with his services?

A.—Certainly.

Q.—There is one thing which rather struck me which occurred in the middle of 1923. You are complaining that Mr. Lewis is too old for the job. He had only been appointed in 1920. Surely you would have known in 1920 that he was going to be too old in three years, and you would not have appointed him to a job which was going to last six or eight years?

A.—Well, a man may be old and fit for his work, and a man may break down suddenly. I do not think you can labour that point.

Q.—It does not say anything about breakdown. You say: "He is still either suffering from bad health or he is too old for the job." If he was too old in 1923, of course he is too old to appoint in 1920?

A.—Yes—well, I do not think you need labour that point.

Q.—I do not wish to. Having regard to what took place out there I should like to ask you one question, which is this. Why, when this dredging was dragging its weary length along in 1923-24, and 1924-25, did you not say to yourself: "I am going out to Bombay for, if necessary, the whole 171 working days, and so put it right"? Do not you think it was your obvious course to pursue? After all, you are the chief engineer for the whole scheme. If the scheme fails it is bound to reflect upon you, is it not, whatever the reason? Did it not ever occur to you to do as I suggest?

A.—I do not think it ever occurred to me to do specifically what you suggest; but Mr. Lewis went on the 12th July, 1924. As I have pointed out, I consider that his retention after his first breakdown was of the very greatest possible harm.

Q.—Was not that an additional reason for you to go out there and pull things round?

A.—No, because he was the man in control of the carrying out of the work—I was not the executive—and if he chose to refuse to give me any information, I was powerless.

Q.—I am looking at it from rather a larger point of view, and that is this: did you not feel you ought in honour bound to go out and pull the thing together and make a success of it?

A.—Nothing is easier than to come to these conclusions sitting round this table; but if you had been in my shoes, I do not think you would have taken any different course.

Q.—I remember once I had some dredging work abroad, and the dredger was not doing what it had been designed to do. It could not do it. I remember going on board one morning and saying: "I am not going to leave this ship until I find out the reason for it." I was there continuously for 48 hours until I did find it out. That is the sort of thing I mean.

A.—Yes; but you presumably were in control.

Q.—Absolutely.

A.—Well—I was not.

Q.—But you could go and take control?

A.—No, I could not. I disagree there.

Chairman.—I should like to know who would have defied you. If you had gone and said to Lewis: "The whole job is going to pieces, I am going to step in and I am going aboard that dredger, and I am going to see what is the matter," who would have disputed your authority? You would have said: "I am here as expert Engineer, Adviser and assistant to Government and I am supervising. 'Supervising' means watching over, and I am going to watch over this work, and I am going to see it start." Who would have defied you then?

A.—Everybody.

Q.—Mention any one of them?
A.—The Director of Development.

Q.—The Director of Development?
A.—Yes.

Sir Frederick Hopkinson.—He was equally interested in pushing the work on, surely?
A.—I say it would have been an unheard of procedure.

Chairman.—If the Director of Development had defied you, it would have taken you exactly eight minutes to get to Government House and to have laid the whole of your case before the Governor. I do feel puzzled about this. I feel that you were in a commanding position, at all events in a position in which, if you had taken command, everybody would have done as you told them. If they did not, your reference was to the Governor, and if the Governor raised technical difficulties about how you were described, the next steamer was your place home, and a public exposure of the way in which the work had been done.

A.—Well, in drawing repeated attention to the necessity for making a change when Mr. Lewis's health broke down, we considered that we were doing all that we could.

Sir Frederick Hopkinson.—When did you decide to abandon the use of the 20-ton blocks?

A.—At a comparatively early date.

Q.—Why did you not decide that before you brought the 20-ton crane fixing them?

A.—I do not remember that we did buy a 20-ton crane.

Q.—Yes, you did. It is there; I have seen it.
A.—But it was bought by Mr. Lewis.

Q.—Not by you?
A.—No.

Chairman.—You mean it was bought by Mr. Lewis at the time when he was in your office?

A.—We did not buy any of the plant; we did not recommend what plant was wanted.

Sir Frederick Hopkinson.—I will use the term you requisitioned it, and you forwarded it to the Director of Contracts to buy.

A.—It was not on our initiative. We did not buy any of that plant on our initiative. Mr. Lewis came home.

Chairman.—Let us get it correct on the facts. Mr. Lewis came to your office, arriving some time in July, 1920?

A.—Yes.

Q.—He was there from August and onwards?
A.—Yes.

Q.—You left 25th August, 1920?
A.—Yes.

Q.—He was assisted by Mr. Meik in the preparation of the plant list?
A.—Yes.

Q.—Amongst items he ordered was a 20-ton crane, which at this moment I suppose is still standing on the sea-wall?

A.—Yes.

Q.—The evidence is that that 20-ton crane was designed to lift and swing out pell-mell 20-ton blocks as a protection from the sea?
A.—Yes.

Q.—You or your firm altered the design, and came to the conclusion that the stone which was being got at Kandivli was sufficient in weight. It is said in the evidence that that crane has never done more than 7-ton blocks, and that very rarely; and that its usual work is on 3-ton and 4-ton blocks?
A.—Yes.

Q.—And to that extent that there has been a waste of money. That is the point.
A.—Mr. Lewis had sole responsibility for the whole of that plant.

Sir Frederick Hopkinson.—That does not agree with what Mr. Lewis says.
A.—I think Mr. Lewis said that he indented on his own.

Q.—No. He said that Mr. Meik and he together got this out. He went so far as to say that Mr. Meik had been advised by a contractor in London not to put up a

gantry as it was unnecessary, but Mr. Meik thought it was a desirable or convenient way of doing the work.

A.—Yes.

Q.—So that Mr. Meik apparently settled all these things in conjunction with Mr. Lewis?

A.—In conjunction with Mr. Lewis.

Q.—I cannot imagine Mr. Lewis designing and settling what plant was required there, because he had no experience behind him that would warrant it?

A.—He had a particular experience in quarry work.

Q.—In small works?

A.—Well, it was a very large quarry. He went home armed with a list of materials he wanted for the quarry.

Q.—But you know as well as I do that the question of managing a quarry is a thing that we generally leave to a foreman, with occasional supervision. You do not want a highly qualified engineer to work a quarry. I have had dozens of them. I have never had an engineer in a quarry in my life.

A.—Yes, I quite appreciate that view.

Q.—There is no experience to be got in a quarry after a couple of days. Then you know pretty well all about it. If the design required 20-ton blocks, a crane obviously naturally followed for that size, and it must be supplied?

A.—Yes. My recollection is—I will look it up—that Mr. Meik wrote a note in which he said that he did not want Mr. Lewis to order the 20-ton crane.

Q.—He would want a 20-ton crane for 20-ton blocks, which was the proposal?

A.—He particularly advised against the purchase of a 20-ton crane until it had been ascertained whether 20-ton blocks were required or not.

Q.—Perhaps you will look that up and let us have it?

A.—I will look that up.*

Q.—Thank you, very much. Again, I cannot imagine Mr. Lewis ordering a 20-ton crane in defiance of Mr. Meik's remarks that it was possibly not required. Now here is an extraordinary thing. I am reading on page 105 of your statement, paragraph 6: "We hope that it will be possible to obtain all the moorum required for the Back Bay scheme in the vicinity of the Kandivli quarry and bring it down from time to time, as each section of the reclamation is completed; and we would emphasise the fact that as the deliveries will be spread over five years or probably more, it should be possible by judicious arrangement to transport the moorum without undue interference with the transport of the stone." The quarry at its maximum was laid out for 2,000 tons a day. I do not know if that is a letter of yours or whether it is a letter of Meik and Buchanan's signed by somebody else, but there is the letter. Now the moorum required in order to do that was 3,600 tons a day. The whole of your transport was fully occupied in dealing with 2,000 tons a day. How could you possibly interpose 3,600 tons to be done by the same plant?

A.—Well, I cannot remember the details of that.

Q.—I should say that instead of being a judicious arrangement it would be a supernatural arrangement. I forgot to mention when we were speaking about the reclamation at the Colaba end that Mr. Thomas stated positively that the reason the dredger could not work in the extreme end of the Colaba reclamation was that a certain storm water drain had been overlooked. I believe he meant this one—that drain is 2,500 feet long and 5 or 6 feet in diameter. He said that was the real reason why the dredger could not start at the end of 1922. Do you know if that is correct?

A.—As far as I can recollect it is quite incorrect.

Q.—Mr. Thomas stated it quite positively.

A.—I think that is a sufficient reason. If Mr. Thomas stated a thing positively I should think it probably was incorrect.

Q.—If Mr. Thomas said "Yes," you would say he meant, "No"?

A.—That is so.

Chairman.—Sir George has lost all faith in Mr. Thomas as a result of the record of his borings. That is how we read your mind.

A.—I had.

Q.—Mr. Thomas has stated positively that the dredging could not go on in block 8 because there was a storm-water drain there which had been overlooked. If Mr. Thomas is the authority for that, you say that confirms me in my belief that the storm water drain was ready?

A.—In point of fact there is a note of mine—I must try and find it—in which I discuss that storm water drain and point out that the dredging can be proceeded with.

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* *See* Appendix XVII.

Sir Frederick Hopkinson.—The dredging was not proceeded with?

A.—The dredging was not proceeded with.

Chairman.—In the absence of that storm water drain or while it was under construction?

A.—Well, I must look that up, if I can. There is also a note of ours to Sir Lawless Hepper in which we say that it is quite evident that Mr. Lewis is so obsessed with the idea of starting dredging at Marine Lines that he refuses to make a beginning at Colaba.

Sir Frederick Hopkinson.—But on that question of borings in Back Bay Sir George said quite positively that the borings were all wrong. It is the first time we have had from any source the suggestion that there is anything wrong with those borings.

Chairman.—I think we might tell Sir George what our information is. When we left Bombay the dredging masters and all the people there were confident that when they went in about this time in November into Back Bay, they would get very good results. That is the impression left on my mind. All the dredging people at Bombay were of opinion—and it can be seen in the evidence—that when they went into Back Bay this year they were going to do very well.

Sir M. Visvesvaraya.—I have that impression.

Sir Frederick Hopkinson.—It was partly on that that this Committee recommended to the Government of Bombay to proceed with this season's work.

Chairman.—It comes as a great surprise to me that the borings of Mr. Thomas are all wrong.

Sir Frederick Hopkinson.—I do not know anything about it.

A.—Mr. Settle has some information on that point.

Chairman.—We must go carefully into that.

A.—Do you say that the dredger was going to be put into the same position?

Q.—Not the " Sir George Lloyd " but the " Kalu."

A.—Yes—that she was going to be put in the same position as she had been in last year?

Q.—Yes.

A.—Mr. Settle will be able to prove to you that she has already been moved 1,000 feet from the place where she was first of all.

Sir Frederick Hopkinson.—She has been dredging, and she has dredged 300,000 to 400,000 cubic yards.

A.—Yes.

Q.—That would take her more than 1,000 feet.

A.—He will explain.

Q.—You say on page 110 that the human factor is all-important. Well, that applies particularly to all constructive works?

A.—Yes.

Q.—Without that proper human factor you can make no success?

A.—That is so.

Q.—What I would like to know is, who has done anything to improve that unhappy state of affairs, when the human factor was not used to produce proper results? Who has done anything, whether by whip or carrot?

A.—Well, I do not think that much has been done to improve the human factor.

Q.—I would like to suggest here that reliance has been placed on letters throughout the whole period. It is action that is wanted, not letters.

A.—Have you ever lived for long in India?

Q.—No, I have not.

A.—Well, if I may say so, it would be a very useful experience to you.

Q.—I have lived in the Sudan, and I encouraged all my staff to look upon the Sudan as a health resort. It was rather difficult, I can tell you, but in the end they agreed in a semi-humorous way that it was.

A.—I suggest that you should go and live a few years in India, and then you would get the proper atmosphere.

Q.—If that is going to lead me to carry on works like the Bombay reclamation, I shall certainly decline to go.

A.—I say in one of my reports that one of the difficulties the Government has in carrying out the work is that they are not allowed to give any encouragement for good service.

Sir Frederick Hopkinson.—I agree that that is a great blot on their procedure.

Chairman.—You have made that point perfectly clear.

A.—Yes.

Q.—It is Mr. Merritt's point put in another way.
A.—Yes.

Chairman.—We remember that.

Sir Frederick Hopkinson.—One word on the last paragraph of your statement about the works being brought to a triumphant conclusion. I suggest that is manifestly impossible; they never can be brought to a triumphant conclusion, and they never will; it is impossible.

A.—Well, again that is a matter of time and opinion.

Q.—No, not of opinion, because the scheme was to have been done in six years. Four years have elapsed, and there is no sight of the end. On this question of control I would like to ask you this. In the case of a work of that kind let to a contractor, would he design and buy the dredger and take it out in the ordinary way? Suppose you let the work to a contractor, he would design and purchase the dredger?

A.—That is a matter of arrangement.

Q.—Suppose you let anyone the contract at so much a yard?
A.—Yes, of course he would.

Q.—He would have a dredger designed, and would buy the dredger?
A.—Yes.

Q.—He would design the gantry for building the sea wall?
A.—He would.

Q.—He would settle on what plant was to be used generally throughout the work —locomotives and cranes?

A.—He would.

Q.—He would also purchase all the plant?
A.—Yes.

Q.—Or requisition it?
A.—Yes.

Q.—And he would engage all the staff?
A.—He would.

Q.—Settle their duties—he would make the dredging programmes?
A.—Yes.

Q.—He would decide where and how the dredgers were to work?
A.—He would. He would do all those things.

Q.—He would approve or disapprove of buying more plant if it were required?
A.—Yes.

Q.—All those things you have done?
A.—We have done a certain number of those things as advisers to Government.

Q.—You have done all of them?

A.—Well, leaving that an open point, the contractor would also have complete control of the costings.

Q.—Let us settle this before we go any further. You have done all those things?
A.—No, I do not accept that.

Q.—Which of those have you not done?
A.—I have bought plant on requisitions.

Q.—Yes.
A.—But I had nothing to do with the settling as to its necessity.

Q.—You had to approve the requisition?
A.—No, I had not.

Q.—In one case you remember you refused to buy it. You said you did not think it was necessary, and you were not going to buy it?

A.—I absolutely refuse to accept the suggestion that I had to approve of the plant. I drew the Chairman's attention to a letter yesterday, and said: "You will note this is a demand, an indent, that I am not asked to approve."

Chairman.—That is the 17th March?

Sir Frederick Hopkinson.—But the original plant was got out by Mr. Lewis in conjunction with Mr. Meik. It was Mr. Meik who settled the procedure.

A.—Excuse me, Mr. Meik did not settle the number of cranes, the number of shovels, and so on.

Q.—That is what Mr. Lewis told us.

A.—Mr. Lewis did not. I read Mr. Lewis's evidence. He said Mr. Meik assisted him.

Q.—You cannot imagine a man like Mr. Meik assisting a man like Mr. Lewis. Would not it be the other way about?

A.—No, I do not agree. Mr. Lewis came to the office and he had the use of the office and the use of the staff. He went to Mr. Meik and said, " What do you think about this? What do you think about that? " I refuse to accept the suggestion that Mr. Lewis was not completely independent to order what he wanted, and I refuse to accept the suggestion that all the plant ordered thereafter was not on demand. It was not for us to say whether we would send it or not. If we wrote and objected, we did it voluntarily as advisers to Government. We had no power whatsoever to say, " We will not send them " or " We will send them." If we suggested " We do not think these things are necessary," the Director of Development said, " I disagree with you and I will allow their purchase."

Q.—So far as the gantry was concerned, Mr. Lewis said positively that Mr. Meik took the advice of a contractor at Westminster and acted against that advice, and said it was the design to build it from a gantry—it was one of your obligations under your contract?

A.—It was one of my obligations.

Q.—The preparation of plans and specification for all the other plant required in connection with the construction of the work?

A.—Yes, on indents received.

Q.—I see what you mean; I see the point.

A.—On indents received.

Q.—But not initiate how much plant was required?

A.—No.

Q.—It is pretty certain that Mr. Meik decided on building that gantry?

A.—Mr. Meik did decide on building that gantry. The gantry was in our original 1919 project.

Q.—It does not matter. He decided that that gantry should be built?

A.—Yes.

Q.—That is a contractor's job, is it not—to decide a point such as that?

A.—Well, in this 1919 Report we considered the best way of carrying out the work, and we designed a gantry. The gantry was some use apparently as it was left in the works afterwards.

Q.—What you mean is the draw was left in?

A.—Yes. It is matter of opinion whether the gantry was necessary or not. I could bring ten engineers to say——

Q.—I am not asking you anything about that. I am only saying that Mr. Meik decided that that gantry should be built?

A.—Yes.

Q.—That is a contractor's job. I am sure you will agree with me there?

A.—Yes, it is a contractor's job.

Q.—I make out that making allowance for the elimination of the concrete blocks and the reduction of the size of the concrete walls, that would reduce your 367 lakhs estimate to 329 lakhs?

A.—Yes.

Q.—The present estimate—that is the present estimate of the engineer—not what you have called the estimate made for political purposes, but Mr. Elgee's present estimate—is 1,000 lakhs. That leaves 671 lakhs as an excess cost over the original estimate. Assuming for the moment that you had let this work to a contractor at 367 lakhs, his loss by the time he had finished the work would have been slightly over £5,000,000 sterling?

A.—No contractor at that time would have taken the work on a fixed basis.

Q.—You think not?

A.—No.

Q.—Not in 1920?

A.—No, I do not think so.

Q.—Not with the sliding scale as contracts were taken in those days, on the advances or reductions in certain items? Generally speaking, surely you would get a contractor to take the dredging and the building of the sea wall on, because the only thing that could affect a contractor out there would be the cost of his plant? Before he made a tender he would get firm offers for the supply of the whole of the plant?

A.—Yes.

Q.—I do not think he would have had any difficulty in getting a tender. However, the point is that had he done so there would have been a loss of £5,000,000. I do not

know of any contractor who could anticipate with complaisance a loss of £5,000,000 on one contract; I do not know if you have ever met one who could?

A.—No; I cannot say that I have.

Q.—The thing is absurd, is it not?

A.—Contractors are not in the habit of losing money if they can help it.

Q.—I quite agree with you. About these steam navvies, I will just make one remark concerning them. You bought four steam navvies. I suggest to you that none of those was suitable for the work it was bought for. They are the wrong type altogether and never could do anything there, and never ought to have been bought?

A.—Well, we did not recommend them.

Q.—Who recommended the first one, the one that was bought in 1920, the "Bucyrus"?

A.—Oh, we come back to the old "Bucyrus"?

Q.—Yes.

A.—I had a telegram—you know all the particulars of it.

Sir Frederick Hopkinson.—I do not. I have never been certain who recommended that.

Chairman.—It started by a telegram sent by Lord Furness to Lord Lloyd, Lord Furness being then on his own yacht at Colombo. He mentioned that there were two "Bucyrus" shovels, and he gave technical details, and he gave prices. There was a cable sent to you asking whether a "Bucyrus" shovel would be of use at the work, and you replied by cable that it would. Do you remember that?

A.—I remember the circumstances. We considered it would be useful for moorum.

Sir Frederick Hopkinson.—My suggestion to you was that it was entirely unsuitable for the work in this quarry?

A.—We had it inspected, and it was purchased.

Q.—But it was the wrong type altogether. None of them could have been any use there. You remember rock crops up all over the place. You could not get a level bed to work the machine on. There are pinnacles of rock all over the place directly you get the moorum off, and no machine could work there.

A—This was intended for moorum.

Q.—That is what I am speaking of—for taking off the moorum?

A.—In the quarry.

Q.—But in the moorum there are pinnacles of rock sticking up all over the place; you could not work the machine at all. It would be idle for three-quarters of the time while you blew off these pinnacles of rock to allow it to move. It is the wrong type of machine altogether. Did you ever in any of your estimates consider the question of interest?

A.—Never.

Q.—You do not say so, I think, in your report anywhere?

A.—No, I do not say so anywhere.

Q.—In work taking six or eight years the question of interest becomes a very important one, does it not?

A.—Yes. I had nothing to do with interest.

Q.—Did you tell the Government that you left them to consider the question of interest?

A.—Well, it was known; there was no need to tell them.

Q.—Up to the present time the cost of the works has been increased by 25 per cent. for interest charges?

A.—Yes.

Q.—That is a very serious addition to an estimate, is it not?

A.—Yes.

Q.—On January 10th, 1923, you wrote: "In particular the annual programme of work should be worked out with the greatest detail and in close conference with the officers concerned, otherwise smooth working is impossible." That is all very well as a statement, but can you tell me what was done? I have never seen any case of a detailed programme for the ensuing year. Can you tell me if that was ever done?

A.—Where is this?

Q.—It is page 20 of volume 8 in your annual report, February, 1922. I have given you the actual words: "In particular the annual programme of work should be worked out in the greatest detail in close conference with the officers concerned, otherwise smooth working is impossible." Did you insist upon an annual programme for the ensuing season being worked out in the greatest detail?

A.—We come again to the old question of writing letters.

Q.—No, supervision.

A.—Supervision—I had no power to insist on anything. I could write that in a report and do my best, but I had no power to do anything.

Q.—Then I will not carry that any further. You have made a complaint that the dredgers have been mishandled; I do not quite know what that means. Do you mind explaining to me exactly what you mean by mishandled?

A.—Well, I should prefer Mr. Settle to do that, he has been in Bombay.

Q.—This is your letter to the " Times " of April 14th, 1926.

A.—I will give you one example. They worked only one shift a day—that is mishandling the dredger.

Q.—We will come to that to-morrow. That is one instance. Then one of the questions that arises on that is, did you give instructions for two or three shifts a day to be worked?

A.—When Mr. Brims went out his instructions were to work 24 hours a day. I put in a letter here yesterday when we wrote out and said, " Are you making arrangements for two shifts? " We got a reply from the Chief Engineer quoting four letters that he had written to the Government asking them to get the necessary crew. I can only repeat that we had no control.

Q.—I do not think I have seen those at all.

A.—It came up yesterday.

Chairman.—Is that one of the letters you have handed in?

A.—Yes.

Chairman.—I have not had time to read all those yet.

Sir Frederick Hopkinson.—I have not got it.

Mr. Ewbank.—I do not think I have seen it.

Chairman.—You say it has been handed in?

Sir H. Courthope-Munroe.—Do you remember the date of it?

A.—I do not remember the date of it.

Chairman.—What is it?

A.—We wrote out to Bombay " Are you doing everything you can to put on two shifts for this dredger? " We telegraphed to that effect. We got a letter back from the chief engineer saying, practically: " I have written four times to the Government asking them to sanction the men, and I have not any reply yet."

Sir Frederick Hopkinson.—I would like to see those letters. I have not seen them yet. Was it your original intention to work the dredger 24 hours a day? *

A.—Yes—well, 15 pumping hours.

Q.—In two or three shifts?

A.—In two shifts.

Q.—Two 12-hour shifts?

A.—Yes.

Q.—I think you said you had nothing to do with the actual agreement with the men who went out, so you cannot tell us if it was provided therein that they should work 12 hours a day?

A.—I cannot tell you.

Q.—Your whole scheme depended upon the dredging, did it not?

A.—Undoubtedly.

Q.—Even if your dredgers did 2,000 yards an hour it would be no good to the success of the scheme if they only worked eight hours a day?

A.—Not the slightest.

Q.—What puzzles me is that although the dredger began in December, 1923, up to the end of June, 1926, there was no working 24 hours a day.

A.—No.

Q.—It seemed to come as a shock to them that I suggested that they ought to work 24 hours a day. It was an absolute shock to them.

A.—You will see it in Mr. Brims' evidence. He says that when he left London he left London with instructions to work 24 hours a day.

Q.—What I would like to know is: who is responsible for working only a single shift of eight hours in the first season, and a double shift of eight hours each in the second season? Your scheme as a scheme was destroyed by that?

A.—Yes. I say the responsibility was with the Executive.

Q.—There again comes up the question: what did you do?

A.—Well, we have said quite enough about what we can do; but there you are up against it. How can you guarantee a dredger's output if your hands are tied behind

* See Appendix VI.

you and you have no power to give bonouses or appoint dredger men or increase their pay, or make any arrangement at all?

Q.—Did you ask me what should I do?

A.—I said would you consider yourself responsible under those conditions.

Q.—I thought you said you would like to know what I would do. I can tell you exactly what I should do. I should leave the vessel. I should not stay there five minutes. In the same letter you say that nevertheless the dredger has done nearly double the work attributed to it?

A.—Yes.

Q.—Can you explain that? The work is measured by your staff out there. Do you say they have under-measured it by 100 per cent.?

A.—No; we know about that. That is the old question of the leaking through the wall.

Q.—But they have attributed to them only the quantity dredged?

A.—No.

Sir Frederick Hopkinson.—The figures have all been given to us.

Chairman.—There are two columns. 1,020 dredged, 627 retained; 856 dredged, 462 retained.

A.—I cannot follow that.

Q.—It is quite simple. I will just give you the figures. It is page 3 of Sir Lawless Hepper's report: 1923-24, 1,020 dredged, 627 retained; 1924-25, 856 dredged, 462 retained; loss of more than 40 per cent. in 1923-24; a loss of more than 55 per cent. in 1924-25. It is a total loss of 900,000 cubic yards. That is how the figures are split up.

Sir Frederick Hopkinson.—You cannot blame the dredger if the material leaks through the wall.

A.—No.

Q.—It is nothing to do with the dredger.

A.—That is quite true.

Q.—You must not consider that in judging the dredger.

A.—That is so.

Q.—You must take the quantity that the dredger has done by the sections in the harbour?

A.—Yes.

Q.—That is what I presume the engineers have done in giving the total quantity dredged, because they have all these soundings. They are done in a very inefficient way, because instead of plotting the sections, as they ought to plot them, they are going on the soundings?

A.—Yes; I can quite understand that.

Q.—So that was a misstatement, where you say it has done double the work attributed to it? You probably did not know that they had made that allowance?

A.—Probably not.

Q.—Further on you say that you know the dredging results have improved enormously this year. I am sorry to say that is not correct. I think they are a little worse than previously. There is no enormous improvement at all?

A.—Well, I am not surprised.

Q.—But you said as a fact that they had improved?

A.—Well, I understand they have improved.

Q.—Not at all. They are, if anything, a little worse.

A.—Very well.

Chairman.—I am not sure that that is so.

Sir Frederick Hopkinson.—I beg your pardon. There was a little improvement in the third year. It was 1,020 the first season per pumping hour; 856 the second season, and 959 the third. I had transposed the figures?

A.—Yes.

Sir Frederick Hopkinson.—But that is not an enormous appreciation.

Sir M. Visvesvaraya.—Did not they get 1,800,000 yards?

Sir Frederick Hopkinson.—That will include both dredgers.

Chairman.—But how much they retained they did not know.

Sir M. Visvesvaraya.—They say they retained more than they got.

Sir Frederick Hopkinson.—It is only fair that that should be pointed out to you. The last figures show the impossibility that they retained more than they dredged.

Sir M. Visvesvaraya.—Probably they over-estimated the loss.

Chairman.—About the letter where the double shift occurs, these are the only documents I have: the note that you handed in yesterday, the proof of Mr. Halcrow, Mr. Settle's statement, and this other document. I do not quite follow what this is. Is it possible it was handed back to you?

A.—It is possible it was handed back. I will look for it. At all events, you remember its being put in. I read it.

Q.—My memory fails me for that, but it will be on the Shorthand Note?

A.—Yes.

Sir Frederick Hopkinson.—I do not remember hearing it.

A.—I read it.

Chairman.—Then it will be on the Shorthand Note?

A.—It will be on the Shorthand Note.

Q.—Would it be convenient for Mr. Halcrow to come at 11 o'clock to-morrow morning?

A.—Am I nearly finished?

Sir Frederick Hopkinson.—I have only two subjects to deal with. It is not worth while starting on them at two minutes to five.

A.—Which are they.

Sir Frederick Hopkinson.—Dredging and estimates.

Chairman.— Do you prefer to come to-morrow morning yourself or interpose Mr. Halcrow? What do you say.

Sir H. Courthope-Munroe.—I do not quite gather what the question is.

Chairman.—Sir George Buchanan has been in the box for four days and is probably tired. It will only be a question of a couple of hours to finish him off. The point is would he like to go on to-morrow morning, or would he care to have a rest and interpose Mr. Halcrow? We are trying to suit Sir George's convenience in the matter.

Witness.—Yes; Mr. Halcrow can come to-morrow.

Chairman.—Then Mr. Halcrow and Mr. Settle will be begun to-morrow.

Sir H. Courthope-Munroe.—You have got his report. That has been handed in with his draft proof.

Chairman.—That is right. We hope to get through both of these gentlemen to-morrow, but we do not want them to leave the room without having told us everything they wish to. There is one other matter. We have all a demi-official engagement at half-past 12 until 3, so that we would adjourn at half-past 12 and return here at 3 o'clock.

Sir H. Courthope-Munroe.—If you please. It is understood that Sir George Buchanan will not be here to-morrow.

Chairman.—No; Sir George Buchanan will not be here to-morrow, but we will spend the day with Mr. Halcrow and Mr. Settle. If convenient to you we could sit at 10.30.

Sir H. Courthope-Munroe.—No; I should prefer 11 o'clock.

Chairman.—Very well.

(Adjourned to to-morrow at 11 a.m.)

The Committee Assembled at 11 a.m. on the 3rd November, 1926, all the Members being present.

56th Witness, Mr. William Thomson Halcrow, M. Inst. C.E.

WRITTEN STATEMENT.

My connection with the Back Bay Reclamation Scheme dates from October, 1922. At that time I was asked by the late Mr. C. S. Meik to visit and inspect various works abroad for which his firm were the engineers, including the Back Bay Reclamation Scheme.

Sir George Buchanan, whom I had met on one or two occasions, had already left for the East, and the general particulars of the Back Bay works and personnel were described to me by Mr. C. S. Meik.

I learnt that Sir George Buchanan had been called in to report on the scheme and that the Government of Bombay had decided to adopt his report and had appointed the firm as engineers for the work.

I was also informed that the Government of Bombay had entrusted the execution of the work to the Development Department under the management of its Director, Sir Lawless Hepper.

The firm had to advise the Government of any matters which they considered necessary in connection with the carrying out of the work.

In addition to the ordinary duties of engineers for large works, the firm had to invite tenders and examine and report to the India Stores Department upon the tenders for any plant which the Development Directorate desired to purchase in this country. When orders were placed by the India Stores Department, the firm carried out the necessary inspections and tests and reported progress to the Development Department.

Also, in the case of staff or other employees which the Department required from this country, the firm assisted the High Commissioner in the selection of suitable men. The agreements under which the men were engaged were prepared by the Government and the salaries, wages, or terms of appointment were fixed by the Development Department.

Prior to my departure for the East I was shown copies of the drawings of the work and handed copies of the detailed specifications which the firm had prepared and also a copy of the Development Department's project estimate and programme for carrying out the work.

I arrived in Bombay on 1st December, 1922, and left on 20th January, 1923.

On arrival in Bombay, I presented my letter of introduction to Sir Lawless Hepper and had an interview with him. I had already studied his project estimate and drew attention to one item which in my opinion required the most serious reconsideration, namely, that the Department did not propose to commence dredging until the season 1924-25. The dredger " Sir George Lloyd " had arrived in Bombay in time to commence dredging in the season 1922-23 and the state of the works at that time was such that there did not appear to be any reason why the commencement should not have been made in that season. The Director did not appear to be very interested in my suggestions and passed me on to his Chief Engineer.

I had several interviews with the Chief Engineer, who was I thought in a very poor state of health. Although I was anxious to learn something of the methods which the Development Department adopted for carrying out the work, it appeared to me by his attitude that the Department objected to anything suggestive of interference on the part of the engineers in matters of construction.

I was particularly anxious to see the detailed programme for working the dredging plant but failed to obtain any information as to whether a programme had been prepared or not. I formed the opinion that the Department had not dealt with this matter as they had laid out their general programme to commence operations in the season 1924-25 and it was then only 1922.

Regarding designs for permanent work, which it was the firm's duty to prepare, I learned before leaving London that some difficulty had arisen through the Chief Engineer in his capacity of Resident Engineer refusing to send home the data necessary to complete the designs of the storm-water drains.

I discussed this matter with the Chief Engineer, who informed me that the Director of Development had instructed him not to send the information as a question had been raised as to whether these drains were included in our work. I learned that the drains had all been designed and that work on their construction had already commenced, and in the case of one culvert work was approaching completion.

I made the following note at the time that we had asked the Chief Engineer to show us the drawings for the drains : " Difficulties were at once put in the way and all sorts of objections raised by the Chief Engineer."

It was subsequently decided that the drains were part of the work comprised in forming the reclamation, and later on copies of the plans prepared by the Development Department were sent to London.

In this connection the question of whether or not the system of roads and drains as laid down by the consulting Town Planner should be included in the firm's work was discussed. The complete lay-out of the reclaimed area had not originally been contemplated and in my view the Government of Bombay would not complete the surface as a whole for many years to come. It was decided at that time that the firm's work referred to the reclamation only and not to the lay-out.

While I found it difficult to obtain information about the work from the Chief Engineer, I was introduced to the Deputy Chief Engineers and paid several visits to each of the sections under their charge. Here, I learned something of the organisation of the work. The Deputy Chief Engineers (sub-agents, as a contractor would call them) complained that there were no conferences regarding the work as a whole, that each worked in a watertight compartment, and was given a minimum of information by their chief. I note that in the evidence taken by the Committee in Bombay, the present

Chief Engineer (Mr. H. A. Elgee), who was then Deputy Chief Engineer, Marine Lines, stated that he had never been given detailed specifications for the work, although these specifications had been prepared.

Two of the three Deputy Chief Engineers appeared to be dissatisfied with their seniors in command; the third did not make any complaints, but was anxious to find another billet when he next came home on leave.

As an instance of the manner in which the general management of the work was conducted by the Department, on one occasion when I visited the Colaba section, the Deputy Chief Engineer told me that he had just received two steam cranes which he did not want, as he had already more cranes then he required.

The firm informed me that in their capacity as advisers to the Bombay Government they had had occasion to point out that the Development Department were in their opinion ordering quantities of plant which appeared to them to be excessive. They asked me to look into this matter and let them know whether I thought they were unjust in their criticisms. I examined the quantities of material to be handled, basing as requirements the Development Department's project estimate and programme of work. After allowing that the Department would require more plant than a contractor would place on the works, I estimated that there was a considerable excess of land plant. The Department's working programme in relation to the quarry output I subjected to criticism. The average annual output of stone required was about 230,000 cubic yards, the programme required for the year 1923-24 an output of 440,000 cubic yards, which is nearly double the average output. To handle this quantity, considerably more plant would be required than would have been necessary under a more evenly proportioned programme.

In the case of the concrete, the ratio of maximum output for one year of the average is even greater, the figures being 27,500 as against 64,000 for the season 1923-24.

When discussing the matter of excessive rolling stock and other plant to handle stone, I was informed that the Back Bay scheme was not the only work for which Kandivlee quarry had been opened and that the Development Department had other uses for the stone. As the firm had nothing to do with these other works, further criticism was of little value.

In the notes I made of my first visit, the following occurs: " Of the 24 cranes of various types on the works, only five were working during my inspection." This condition of affairs continued throughout my visit, and I saw enough to form the opinion that Sir George Buchanan was justified in his criticism of extravagance.

I inspected the materials used for concrete, and checked the relative proportions of aggregate and cement. These I found to be in accordance with the firm's specifications for the work.

Several matters concerning the construction of the permanent works were discussed during my visit and it was impressed upon the Development Department the necessity for carrying forward the protection stone to the rubble mound so that it might be deposited before the monsoon broke. I mentioned also the necessity for using the run of the quarry for the rubble wall; they would thus have all sizes of stone.

I note from the evidence taken in Bombay that uncertainty is implied as to how or why large stones were substituted for concrete blocks. I quote the following clauses from the firm's specification :—

> *Reclamation Wall. Clause* 46.—The Northern section of the wall which is referred to in this specification is to consist of a continuous bank or mound of rubble stone surmounted by a superstructure of mass concrete, the rubble stone being obtained from the quarry at Kandivlee. All stone used in the work is to be of best quality, hard, sound, and free from all imperfections.
>
> Before blasting and quarrying the rock the overburden is to be removed so that the stone can be obtained free from any clay, soil or sand.
>
> The stone, after being blasted and broken down, and before it leaves the quarry, is to be graded as follows :—Large stone 4 tons in weight and over are to be reserved for protecting the sea face of the wall. The remainder will be used for the rubble mound and for crushing for concrete aggregate.
>
> *Protection on Sea Face of Rubble Mound. Clause* 49.—After the concrete wall referred to in the last clause is completed for a sufficient length and before the finishing layer of concrete is placed on it, large stones (see Clause 50) or alternatively concrete blocks are to be deposited on the sea face of the rubble mound.
>
> *Large Stones on Sea Face. Clause* 50.—If a sufficient number of suitable stones not less than 4 tons in weight can be obtained from the quarry the Engineers may permit them to be used for protecting the sloping sea face of the rubble mound. All such stones are to be brought from the quarry in suitable wagons which are to be conveyed over a temporary railway placed on the top of the concrete wall to a travelling crane also on the wall. The stones are to be lifted by this

crane and deposited on the slope of the rubble mound commencing from the toe of the slope and working up to the base of the wall. Care is to be taken in selecting the stones so as to get them wedged together in order to prevent their being moved by the action of the sea.

Large Concrete Blocks on Sea Face. Clause 51.—Should a sufficient number of large stones not be procurable from the quarry then large blocks of concrete are to be used for the protection of the sea face of the rubble mound; these blocks will weigh approximately 20 tons each and are to be of the dimensions shown on the drawings, having all edges chamfered 2 inches by 2 inches measured on the square. They are to be made in accordance with Clause 37 herein in the proportion of 1 of cement to 6 of aggregates and are not to be deposited on the sea face until they are 3 months old.

If concrete blocks are used they are to be placed " pell mell " on the surface of the rubble mound as it will not be possible to wedge them together as specified for the stones.

In London, after the death of Mr. C. S. Meik, I acted for Sir George Buchanan when he was away and assisted in examining and reporting on tenders for plant ordered by the Development Department, and in examining applications by candidates for vacancies on the staff of the Development Department which were sent to us by the High Commissioner.

As an instance of the attitude of the Development Department to my firm, when Mr. J. R. Settle, M.Inst.C.E., an Engineer with much greater experience in the design and construction of sea works than any member of the Development Department, of whose record I am acquainted, returned from Bombay, I learned that the senior members of the Department did not avail themselves of his knowledge and experience.

Estimates.

When Sir George Buchanan reported to the Government of Bombay on the Back Bay Scheme, in 1919, he estimated the cost of the work at 367.61 lakhs. It is well known to all Engineers or Contractors who carried out public works during the years following the termination of the war that there was an enormous increase in all prices during 1920 and 1921; such increases could not have been foreseen and authorities and companies suffered financially in consequence.

During the period to which I refer, I have knowledge of extensive sea works carried out in the Tropics, of which the following brief particulars are of importance.

The increase in prices between 1912 and 1919 was from 10 to 20 per cent. and between the end of 1919 and 1921 from 50 per cent. to 100 per cent.

This case is parallel to the Back Bay work which passed through the same phases as regards cost.

The prices in Sir George Buchanan's report of 1919 compare well with prices of the work referred to above and in some cases are higher.

When I read Sir George Buchanan's report and had beside me at the time the Development Department's project estimate, I applied to the former's estimate a percentage based upon my knowledge and experience of works carried out after the war and I found that, after deducting from the project estimate a sum which had been included to cover the cost of the Town Planner's lay-out of the reclaimed area, which was not contemplated at the time Sir George Buchanan's estimate was made, I found that the project estimate for the reclamation proper was rather in excess of what I would have considered a reasonable increase to Sir George Buchanan's estimate. It is, in my opinion, wrong and misleading to the public to compare any estimate prepared in 1919 with an estimate of 1922 without allowing for the rise in prices which took place after the war and which could not have been foreseen in 1919.

In the knowledge of what the work has actually cost, as carried out by the Development Department, Sir George Buchanan's estimate of 1919 is, in my opinion, a fair one. Having learned that the late Mr. C. S. Meik had been closely associated with Sir George Buchanan in the preparation of the estimate, I am convinced that no better or more reliable estimate could have been prepared at the time.

Sir George Buchanan complained that the project estimate, which was prepared by the Development Department and approved by the Government without his knowledge, was excessive; that he was justified in his statement has been shown in the evidence taken in Bombay in which Sir Lawless Hepper states that he anticipates a saving on the works other than dredging of 35 lakhs.

As regards the cost of dredging, the Development Department estimated to operate the plant at a cost of 5 annas per cubic yard. Sir Lawless Hepper has revised that estimate and now states that the dredging will cost 310 lakhs instead of 82 as he originally estimated. It has been revealed by the evidence taken by the Committee in Bombay that the revised dredging estimates were based on improper data and are therefore of no value.

While I accept all figures and measurements made by the Development Department with reserve, in the absence of proper cost abstracts, I feel disposed to accept the figure given by the Deputy Chief Engineer, Dredging, in evidence as to the present cost, viz., 8 annas per cubic yard. This cost is the result of working the dredgers for less than two-thirds of their proper time, and further without energy or incentive to the men to get the best out of the plant, and it is difficult to believe that the dredging cannot be carried out at about the rate of 5 annas estimated by the Development Department themselves, working full time.

Dredging.

It has been proclaimed to the world that the dredging plant is a failure, and that in consequence the cost of the work will be 1,100 lakhs instead of 700 lakhs of rupees; also that this state of affairs is entirely due to Sir George Buchanan. The estimates and statements are absolutely misleading and inaccurate, as has been revealed in the evidence taken in Bombay.

The Development Department laid out their programme of work to commence dredging in the season 1924-25. (See print copy of project estimate.)

In consequence of a protest by Sir George Buchanan, the Development Department improved upon their programme and commenced dredging in the season 1923-24. As far as my investigation of the work went, I could see no reason why the dredging could not have been commenced in the year 1922-23, the dredging plant having arrived in Bombay in time for that season.

In the spring of 1925, having perused the weekly statement of progress which was sent to London, a letter was addressed to the Department drawing their attention to the low output of the dredgers. The reply received was unsatisfactory, and only emphasised what I have always felt with regard to the Development Department, that they resented interference by the engineers in matters of execution.

In July of 1925, a letter was received from Bombay informing us of the revised estimate which had been prepared based on the actual dredging output. On reading this letter I concluded that the estimate must have been prepared for special reasons, and, on the face of it, was grossly misleading. This is the only conclusion at which any fair-minded engineer could arrive.

Mr. Brims, the Deputy Chief Engineer, Dredging, came home on leave in the summer of 1925 and called to see me. I took the opportunity of trying to find out what was at the bottom of the dredging difficulty in Bombay. Mr. Brims was rather reticent, but I learned enough of the way things were going to come to the conclusion that the dredging plant as a whole was not being properly handled.

The material did not differ from what was expected, but he admitted that there had been a tendency to get the last yard of material which the dredger would cut. I told him it was, in my opinion, a mistake to attempt to scrape hard material from the bottom. There were ample supplies of mud and clay, for which the dredger was built, and to retard the output for a few yards of hard moorum was not right. One result of scraping the bottom was that the cutter blades were damaged.

Sir George Buchanan, owing to serious ill-health, was unable to proceed to Bombay, and returned to this country, when I put before him all that I had learned. He protested to the Department in reply to their 11-crore estimate that they were mishandling the plant, and that he was justified in making that statement has been proved by the evidence taken in Bombay. Two points only need be mentioned to prove mishandling: (1) The dredgers had not even by the end of the second working season been put on their full working time of 24 hours a day, and (2) no incentive by way of bonus to the crews of the vessels had been arranged. Brims admitted to me that he had never known of a case of the kind where bonus was not arranged right away at the start of the work. This is the standard practice of the most experienced contractors in dredging, and the Director of Development certainly made a grave error of judgment in not insisting that the dredgers should work 24 hours a day and that the men should be properly bonused on output.

Although the Director states that he knows nothing about dredging, he might have learned something from his staff, some of whom, to my knowledge, had been many years on the staffs of eminent firms of contractors. Brims spent years on a large dredging contract where they continuously worked two shifts of 12 hours a day.

Brims stated that apart from dredging he felt that he did not get the support he would have liked from his superiors. He told me that much material was being lost through the wall, and that he wanted to blind it, but this was not allowed.

Mr. Settle reported on his return from Bombay that Mr. Brims, the Deputy Chief Engineer, and Mr. Speirs, the dredging-master, spent much of their time in superintending the overhaul of the "Jinga." In fact, the operating of the expensive dredging plant appears to have been left largely to the assistant dredging-masters, who came fifth in order of seniority.

I have particulars of dredging on fixed price contracts amounting to more than 15 million cubic yards. On one home contract the working hours were 132 per week, being 11 shifts of 12 hours, and on another contract in the tropics the working hours were 144 per week in two shifts per day.

Sir George Buchanan in his estimate allowed 15 hours pumping time per day of 24 hours, which is equivalent to 62½ per cent. actual pumping time for the dredging plant. This is a reasonable estimate.

It has been suggested in the evidence that the nature of the materials to be dredged in the harbour was not known. In all my experience I have never come across a mass of material so thoroughly investigated by boring as the area under consideration. Over 1,300 borings were taken. In the case of the dredging contracts to which I have referred above, less than 5 per cent. of that number of borings had been taken for the removal of 15 million cubic yards of material; the contractors in these cases did not take any borings to verify those placed before them when tendering and carried out the work as already stated on fixed prices.

My experience is that when borings err, as they sometimes do, the level of hard material has invariably been found at a lower level than that indicated by the borings. I can find no evidence that the depths of dredgable material in the harbour are less than those indicated by the borings; on the contrary, it has been stated in evidence that the materials have so far generally agreed with the borings.

The material in the harbour consists of mud, soft clay and stiff greasy clay, overlying hard materials, rock and some hard moorum. A dredger should be designed to give an average output on the average material, which is soft clay. Stiff unctuous clay is good material for a vessel of the type of the " Sir George Lloyd " to cut, and represents the hardest material required to be dredged.

The output per hour, as returned by the Development Department, for the " Sir George Lloyd " is only about 50 per cent. of the designed output, and personally I was not surprised at the low figure when I learned that no proper system of bonus had been arranged at the start as an incentive to the crews to get the best out of the plant.

The number of pumping days worked by the " Sir George Lloyd " last year is stated as 167, and there was a delay of 17 days, which proves that Sir George Buchanan's estimate of 170 days was reasonable.

The Development Department state that the dredger can average 2,000 cubic yards an hour for a month. If for a month, there is no reason why it cannot continue for six months.

Much has been said in evidence about a guarantee by the builders that the dredger would pump 2,000 cubic yards per hour. I do not remember any case where the builders of plant for constructional works were to guarantee that purchasers would obtain a specified output.

When purchasing plant for excavating purposes, say, dredgers, land excavators, grab cranes, &c., it is customary to have a detailed specification for the boiler and engines and to require certain speeds of operating, e.g., lifting, slewing, derricking, travelling speeds, or in the case of dredgers, when of the bucket type, the number of buckets lifted per minute, and where of the suction type, the discharge and power of the pump.

The plant is tested against the specification before being taken over from the builders, and the purchaser takes the responsibility of getting the best out of the machine. Experience alone teaches those who handle excavators or dredgers what outputs to expect in varying classes of material. Although I have experience of hundreds of thousands of pounds' worth of plant purchased and handled, I do not recollect one case of a guarantee by builders that purchasers would obtain a specified output when worked *in situ*. It is highly improbable that any firm of dredger builders would guarantee a specified output for a dredger worked by the Development or any other Department.

Mr. Wm. McMurray, Director of Messrs. Wm. Simons & Company, Limited, told me he was in Bombay when the dredger " Sir George Lloyd " was first put to work, and that he had endeavoured to help the Department in any way he could, but his efforts were not well received. He felt he was not wanted and left Bombay.

Criticism has been made that it was estimated that the nett result of the filling would be the same as the quantity of material dredged from the virgin strata at the bottom of the harbour. All forms of clay bulk when cut out of their natural beds are deposited as filling. Mud contains a much higher percentage of water when pumped through a pipe-line and deposited as filling. The surface of the mud when exposed to the sun will dry out and give up a considerable quantity of its moisture, but the drying out will not carry to any great depth, especially in the case of the Bombay material, which has an unctuous nature. On balance, one would expect an increase of bulk, and an estimate allowing for no bulking would be said to be on the safe side. According to the figures given in the evidence on the season's work completed this year, the bulking works out at 24½ per cent.

Evidence has been given as to the manner in which the possible shrinkage was investigated. One witness explains that he took a pot of the finest surface mud from the reclamation, evaporated the sample, and based a calculation for the whole scheme on the result, which showed some 35 per cent. shrinkage, and I gather was the basis of the 40 per cent. figure in one estimate.

Again, moorum filling is assumed to shrink after excavating from the solid when deposited in Back Bay.

It is stated that considerable loss took place in the reclamation, due to material escaping through the rubble part of the wall. The specification for the rubble is given in clause 46 as already quoted above.

If the run of the quarry be tipped in the wall, the interstices depend on the nature of the material as quarried. If there is a large percentage of small material, the rubble would be choked by the pumped filling. In the case of a large reclamation with which I am acquainted, no blanketing was put on the mound. In that case the class of stone contained a large percentage of small material. After his 1923-24 visit, I enquired of Sir George Buchanan regarding this point, and he informed me that he saw very little loss through the rubble, but that there was considerable loss through an opening in the wall, which he advised the Department to have closed up. The necessity or otherwise for blanketing the mound with moorum or similar material was discussed during my visit to Bombay, and I understood the matter was left to the Chief Engineer to observe carefully what actually took place, report, and take the necessary action. If the loss of fine material was not serious, it was to the advantage of the reclamation to have a large quantity of better material and save on the moorum topping. It would appear, however, that if the measurements of the Development Department are correct that the loss was considerable in the first and second years, but no report to that effect ever reached my office until the final figures for the season were available. In the third year there was a large gain.

When in Bombay I learned that the then Chief Engineer of the Department was very anxious to find the whole of the material for the filling in Back Bay, because he believed it to be better material than that which was available in the harbour. He had in hand at that time a series of borings in Back Bay, the results of which he eventually reported, stating that there was available 25,332,000 cubic yards, or more than enough for the whole reclamation.

The material would be more difficult to obtain, and the programme eventually decided upon was to fill the Marine Lines end from Back Bay by the " Kalu " and the centre and southern parts from the harbour, as originally intended. This arrangement overcame the difficulties which had been put in the way by the Port Trust and the Royal Indian Marine, who wished to restrict the area of dredging in the harbour.

In order to help the Department we looked into the question of the best way to put the " Kalu " to work in Back Bay. I suggested that the " Kalu " should cut a flotation channel, pumping the material through a short pipe-line, say 100 yards, to one side; having reached a pre-determined point she would connect up to the pipe-line and commence pumping into the reclamation. To cut a channel, the removal of about 100,000 cubic yards of material was necessary. With the dredger working her full time, but only allowing one-third of her output, say 500 yards an hour, the cut could have been completed in two to three weeks.

Viewing the dredging as a whole, notwithstanding the methods adopted by the Department in handling the plant, they have accomplished about 4,000,000 cubic yards of filling out of a total of 25,000,000. They admit in evidence that they could increase the output of the " Sir George Lloyd " by 50 per cent. This they can obviously do if they work the customary 24 hours a day instead of 16, and drop the luxury of stopping for meals. That would bring the " Sir George Lloyd's " output of dredging (based on the figures given in evidence for last season) up to $2\frac{3}{4}$ million cubic yards per annum, but this output could be greatly increased by proper organisation and should reach 5 millions with the excellent plant and ample quantities of good dredgable material proved. The " Kalu " is reported to have dredged 338,000 cubic yards in $2\frac{1}{2}$ months. In six months she could do, say, 800,000 cubic yards, and if put on proper working time this would be increased by 50 per cent. and reach 1,200,000 cubic yards.

Without allowing for any improvement in intensity of output due to organisation the two vessels as worked by the Department could dredge 4 million cubic yards per season.

According to the project estimate, at the end of the season 1925-26 the amount of dredging accomplished should have been $7\frac{1}{2}$ million cubic yards. Against this they have accomplished 4 million cubic yards. To complete the work within the Development Department's project estimate, viz., by the end of the season 1930-31, there remain five seasons still to go and the quantity to be handled about 21 million cubic yards. In five seasons this represents 4,200,000 cubic yards per season, so that with the plant available and without exercising any greater energy than in the past, except to work

the dredgers 24 hours a day instead of 16, they could finish the work in accordance with their own estimate.

Sir George Buchanan's and C. S. Meik and Buchanan's Position with Regard to the Work.

Conflicting evidence has been heard with regard to the position of the Engineers for the work, and some confusion appears to exist as to the relative meaning of the terms "Consulting Engineers" and "Engineers responsible for supervising the work." Professional firms or the individual partners in a firm are sometimes the one and sometimes the other. I occupy both positions at the present moment. As Consulting Engineer I report and advise when requested, but my clients have their own engineering staff who prepare designs and specifications, and when required I examine plans submitted and visit and inspect works under contruction. As Engineer for works, I am responsible for preparing plans and specifications and supervising the construction of the works, but in no case do I have executive control over plant or labour.

In the case of Back Bay the firm were appointed "Engineers." They prepared plans and specifications of the permanent work in accordance with the practice of the profession and inspected the carrying out of the work. The Government of Bombay placed the execution of the works in the hands of the Development Directorate who took the same position as contractors, and rightly assumed full control. They prepared their own works programmes and submitted to the Government their own estimates for carrying out the work. They ordered the plant and materials, and engaged the men they required. They fixed rates of pay and arranged sub-contracts, all without reference to the Engineers.

In view of the work being departmental, Sir George Buchanan undertook to prepare enquiries for plant, to examine them and advise the India Stores Department on tenders received, and to inspect plant before shipment. He also agreed to advise the Government on all matters relating to the works under construction. All these duties have, as far as I can judge, been performed. The Director of Development in many cases did not act on his advice when given, clearly showing that he knew that the responsibility for the execution of the works rested on his own shoulders.

Sir George Buchanan had to visit the works every year. He did so and remained in Bombay for a longer period than was necessary in my opinion, and certainly much longer than I have ever known an Engineer for large works to stay. The opinion I have formed from my knowledge of the work is that the Director of Development did not approve of having an independent engineer who could criticise the work.

No Engineer or Contractor could possibly be in executive charge of works unless all the staff and employees were subject to his orders, and he was in a position to engage or dismiss whom he willed. It is absurd to suggest that Sir George Buchanan or the firm held that position. It is neither implied nor stated in their agreement, and I have not seen any evidence to lead me to believe that there was any intention other than that the Development Directorate were to be in sole charge of construction, as in fact they were.

It is possible that the position of the Chief Engineer requires explanation. The Director of Development had works other than the Back Bay scheme under his charge, and the firm had the nomination of a resident engineer for Back Bay who had to carry out the duties of the chief executive officer to the Director. Such cases only occur when work is done "departmentally." The duties of the resident engineer are light in the circumstances, but at one time the Government suggested that the firm should have a separate staff. Sir George Buchanan has dealt with this matter in his statement. Personally, I should have preferred that the firm had had a separate resident engineer under their direct control.

The dual position is not novel. I occupied a similar position on a pier work some twenty years ago, being responsible to the firm's clients direct for the execution of the work and to the firm for carrying out their plans and specifications.

More recently, in 1922, and also abroad, a harbour work was let by contract under competitive tender, and we appointed our resident engineer. At the end of a year the contractors had made such poor progress that the contract was determined, and the firm's clients decided to carry on the work by direct labour. The resident engineer undertook the work, ordered his plant, and made all arrangements for labour and materials for the clients. He reported progress, and referred all questions as to quality of materials, details of design, etc., to us. The work was completed with entire satisfaction to all parties.

Conclusions.

There is nothing wrong with the Back Bay scheme as an engineering work. It consists of two main items (1) four miles of sea wall and (2) 25 million cubic yards of filling. The former is over 90 per cent. completed, and the design has proved to be

satisfactory; the latter is about 16 per cent. completed, and as I have endeavoured to show above, there does not appear to be any physical reason why the remaining dredging should not be done with the plant available within the time estimated by the Development Directorate, namely, by the summer of 1931.

The outcry against the scheme is unjustifiable from the engineering point of view for the following reasons :—

(1) The sea wall has proved a success.

(2) There are ample quantities of filling material in the harbour and Back Bay. The borings taken by Mr. Kidd in the harbour are the most complete I have ever seen or heard of, and have in practice proved to be reliable. Those taken by the Development Department in Back Bay are open to doubt, but there is plenty of suitable material for filling in the Northern sections of the reclamation.

(3) The dredger " Sir George " if properly handled can give her designed output in the material in the harbour. The Development Department staff have admitted this to the Committee.

An action taken by the Bombay Government is open to criticism. The Advisory Committee appointed to investigate the activities of the Development Department had as its Chairman the Director of Development.

When the Advisory Committee issued their report, which must have given rise to doubt in the minds of the Government, the action to take would have been to refer the matter to the Engineers for the work for their opinion and report. No such action appears to have been taken and the estimate of £8,000,000 was broadcast. A little later, the Government publicly stated that they would have to modify the estimate, showing that the £8,000,000 was of little value.

In my opinion the proper course to pursue was to :—

(1) Complete the sea wall, parapet and storm water drains.

(2) Complete filling, by dredging from the harbour and Back Bay.

(3) Defer moorum filling except where immediately required for roads, or to prevent ponding.

(4) Defer the development of the area as laid out by the Town Planner.

(5) Complete the work by contract.

According to the Development Department's estimate, they required 39 lakhs to complete (1).

On the basis of 5 annas per cubic yard, for operating the dredging plant it would require about 66 lakhs to complete the filling, but the Back Bay material is harder than that in the harbour and will bring up the average cost. Against this, the better class of material will ultimately effect a saving in the moorum topping. Taking an overall average of 7 annas, we have 93 lakhs for dredging.

The total cost for completing the reclaimed area (1) and (2) above is therefore 132 lakhs which, added to 474 lakhs stated to have been spent to 31st July, 1926, gives the total cost of the reclamation at about 606 lakhs of rupees and without allowing credit for the sale of plant on completion of the sections of the work.

When investigating the scheme, I found there was no intention of covering the whole area with moorum one foot deep. That quantity was taken as a sufficient estimate to cover what would be required. Where clay was pumped from the harbour, no moorum would be necessary; on the other hand, in mud areas, the depth would be greater. Land to be built over would not require any moorum.

While land values are outside my province, I am impressed by the figures given in evidence. The cost of the work to date is stated to be 474 lakhs of rupees. The military area is approaching completion, for which the Government of Bombay is to receive 236 lakhs, which is at the rate of 20 rupees per square yard. This figure is the lowest value put upon the land by any witness. The area to be reclaimed is 1,145 acres, or 5,541,800 square yards. At Rs. 20 per square yard, the value is 11 crores. The gross project estimate, which it appears need not be exceeded, is, excluding interest, 770 lakhs.

ORAL EVIDENCE.

Chairman.—Are you now partner with Sir George Buchanan?
A.—I am.

Q.—In December, 1922, when you went to Bombay, what was your position in relation to the firm?

A.—My position was this. At that time I was Resident Engineer on the Lochaber water power works which were about to be commenced, and Mr. Meik put forward a proposition to me that I should join them in partnership. At that time I had that offer made to me, and while I had it under consideration they asked me to go out to India and also to Greece and inspect various works which they had in hand at that time.

Q.—Do you agree with Mr. Kidd that dredging on an open sea front is one of the most difficult, expensive and uncertain operations imaginable in engineering?

A.—It depends entirely upon the open sea front.

Q.—It depends on the extent to which you get tide and wind.—Is that it?

A.—That is right.

Q.—The tide proved a great difficulty at the outset, did it not, in this harbour dredging?

A.—Not on the open sea front.

Q.—In the harbour; that is my question?

A.—In the harbour.

Q.—Did not the tide prove a great difficulty at the outset in this harbour dredging?

A.—I have not been out again, I must say, since my visit in 1922. That was my only visit to Bombay. Therefore my information comes from the correspondence and from interviews with those who have been there. So that I have not seen the dredgers in operation, and therefore, of course, I cannot give my own personal opinion on the matter.

Q.—Is there a misprint at page 7 of your statement, where you say, " The increase in prices between 1912 and 1919 was from 10 to 20 per cent."?

A.—No.

Q.—There is not a misprint?

A.—No. It may not be quite clear as to what I mean there. I am talking about the cost of local labour and materials in the tropics on the works with which I was connected at that time. The increase in wages, and in the purchase of local material, such as timber and so on, amounted to between 10 and 20 per cent. between the period 1912 to 1919. In 1919, towards September, I should think, or possibly October, prices began to soar, and went up by quite 50 per cent. to 100 per cent. between the latter part of 1919 and 1921.

Q.—When you say " prices " are you confining yourself to labour?

A.—Labour and local materials. I am not talking about anything in this country, but only what took place abroad.

Q.—In order to clear up any misapprehension which might exist, we must just follow that up. The phrase in the statement is, " The increase in prices between 1912 and 1919 was from 10 to 20 per cent."—in India?

A.—This was not in India. It was in the Straits Settlements, where Indian labour was largely used.

Q.—After all, Back Bay is India, is it not?

A.—Yes.

Q.—The harbour is India?

A.—Yes.

Q.—The reclamation works are India. Is this meant to be an assertion that in India, which is the only place with which we are concerned, the increase in prices between 1912 and 1919 was from 10 to 20 per cent?

A.—No. What I wish to bring forward here is that during this critical period of 1919 to 1921 I myself was in charge of the construction of large public works——

Q.—One moment. Let us keep to 1912 to 1919 first of all. Does this statement of yours—that the increase in prices between 1912 and 1919 was from 10 to 20 per cent. —apply to India?

A.—This is not stated with reference to India.

Q.—Does it apply to India—yes or no, please?

A.—My figures here——

Q.—Mr. Halcrow, does it apply to India? Tell me yes or no?

A.—That I cannot say.

Q.—But you are the author of this document?

A.—Yes.

Q.—You come here putting this document forward. Tell me yes or no, does that apply to India?

A.—I cannot say whether that applies to India or not. It applies to work on which I was engaged at that time.

Q.—Then, as regards this statement of yours, although you have included it in a report dealing with India and India alone, you say that you do not know that it applies to India?

A.—That is so.

Q.—Now you go to Bombay, and you say the dredger " Sir George Lloyd " had arrived in Bombay in time to commence dredging in the season 1922-23. By that you really mean that she had arrived physically in Bombay in March, 1922. That is all you mean, do you not—that she was there?

A.—She was there.

Q.—There is no doubt about it; it was one of the unfortunate matters in this case. " Had arrived in Bombay in time to commence dredging in the season 1922-23, and the state of the works at that time was such that there did not appear to be any reason why the commencement should not have been made in that season." By that you mean " Why the dredging should not have been commenced in October or November, 1922," do you?

A.—Yes.

Q.—Will you please tell me how much of *this* wall had been constructed in October, 1922? (*Indicating on plan.*)

A.—At that time I think there were——

Q.—Mr. Halcrow, you have made a definite statement?

A.—2,000 feet; I have it here.

Q.—2,000 feet had been constructed. That was the position?

A.—Yes.

Q.—How much of *this* cross-bund had been constructed?

A.—That had not been constructed.

Q.—How much of the storm water drain had been constructed?

A.—That had not been constructed.

Q.—How much of *this* little storm water drain had been constructed?

A.—That one had not been constructed.

Q.—Then will you tell me please, what becomes of your statement that there did not appear to be any reason why the commencement should not have been made in that season?

A.—The opinion that I formed was this—and it can only be an opinion, having gone round the works there, namely, that had the line of railway which takes you out from Colaba to the end of the wall there been arranged in another way, they would have had an area there which would have contained anything up to, perhaps, a figure of about 1,000,000 cubic yards of material, which in my opinion, it would have been worth their while to commence in that season.

Q.—A million cubic yards?

A.—Yes. True, it is a small quantity, but I formed that opinion at that time—that it would have been worth while——

Q.—It is one-thirtieth of the whole amount to be deposited?

A.—I think one-twenty-fifth.

Q.—Well, say one-twenty-fifth. To retain the material, there would have had to have been a cross-bund?

A.—Yes. That was formed in taking the railway out to the wall.

Q.—Where is that shown?

A.—In the corner there.

Q.—Do you really mean it would have been a good business proposition to reclaim *this* little bit?

A.—Down at the end *there*.

Q.—Will you come to the plan and show us what you mean?

(*The witness indicated on the plan.*)

A.—The point I had in mind was this. They carried this railway right away down *there* and took it to the end of the 2,000 feet wall there. I am expressing the opinion that if they had come down further over *here* and joined *there*, they would have had *here* an area which it would have been worth their while to have pressed ahead with.

(*The witness proceeded further to explain by means of the plan.*)

Q.—We have to get this on the shorthand note. The blue line is railway?

A.—Yes.

Q.—When you arrived there you found that railway in *that* position?

A.—Yes.

Q.—That was an accomplished fact?

A.—Yes.

Q.—You say, however, that if, some months before, it had occurred to them to bring the railway down along *this* green line, somewhere in *that* direction, they would have enclosed a larger area?

A.—Yes.

Q. Does it occur to you that the depth along this green line might have been considerably greater than the depth along *here*?

A.—It was not considerably greater.

Q.—At all events, the fact, as you found it, was *this* railway running along *that* blue line?

A.—That is so.

Q.—Then will you tell me, with the facts as they were, and with only 2,000 feet of wall built, with no retaining cross-bund and no storm water drain, how it was possible to begin the dredging in the season of October-November, 1922?

A.—I am endeavouring to describe my visit there and what I learned when I was out there. If it is superfluous in my statement, I shall take it out altogether.

Q.—It is not that. You are here as an expert witness, and you say there did not appear to be any reason why the commencement should not have been made in that season?

A.—Yes, had the works been otherwise arranged.

Q.—What is that?

A.—Had the lay-out of the work been otherwise arranged. That is what I mean when I say that here.

Q.—If the Development Directorate had done constructions differently from what they have it might have been possible to pump in October, 1922?

A.—Yes.

Q.—Naturally, if they had built a cross-bund; if they had built a storm water drain and if they had built a sea wall, they could have begun in October, 1922. But dealing with the hard facts as they were, with only 2,000 feet of wall completed, and no storm water drain, and no cross-bund, pumping could not have begun in October, 1922?

A.—Not as they had it there, no.

Q.—That is right; we understand each other. You say at page 2, " I was particularly anxious to see the detailed programme for working the dredger plant, but failed to obtain any information as to whether a programme had been prepared or not." I do not understand that. If you had asked a plain question, must you not have got a plain answer?

A.—That is what I expected, but I did not get it.

Q.—But it is only a matter of perseverance?

A.—I persevered, but in asking these questions I was asking them of a man who, in my opinion, was a very sick man.

Q.—Surely he was not too sick to answer this question : " Have you got a dredging programme." He was not too sick to be asked that, was he?

A.—He would not answer that question.

Q.—What would he have done? Would he have fainted?

A.—I asked him the question, and I could not get a direct reply.

Q.—Did you study any of the papers in the office before you went out?

A.—The papers I studied——

Q.—Answer the question. Did you study any of the papers before you went out, is my first question?

A.—I studied certain papers.

Q.—Amongst them did you notice the dredging programme prepared in Sir George Buchanan's office, of April, 1921?

A.—No.

Q.—In fact that dredging programme was in the office of the Development Directorate at the moment, but you say that notwithstanding all your efforts you could not get any information from anybody as to whether there was a dredging programme in existence?

A.—Other than *this* programme.

Q.—What is that document?

A.—This document is described as the project estimate. That is the only document I had. I knew of no other programme. I wanted the elaboration of *this* programme.

Q.—Certainly. We all understand. What you wanted was the dredging programme?

A.—The elaboration of *this* programme.

Q.—And especially, I suppose, the work that the dredger was going to do as soon as she was put in commission?

A.—You mean the output?

Q.—Especially the work that the dredger was going to do—where she was going to dredge?

A.—Exactly.

Q.—The length of the pipe line; the position of the shore line; the position of discharge. All those matters you wanted?

A.—Yes.

Q.—It is Mr. Lewis you are referring to?

A.—I am referring to Mr. Lewis.

Q.—Mr. Lewis was too ill to explain to you whether or not they had any dredging programme?

A.—That is so.

Q.—That was in October, 1922. In those circumstances did it not occur to you that you should have cabled home to Sir George Buchanan at once? Was Sir George Buchanan in India?

A.—Sir George Buchanan was there I must explain, during the whole time of my visit.

Q.—Did not you at once hurry off to Sir George Buchanan and say to him "I cannot even get from Mr. Lewis whether there is a dredging programme"?

A.—I did.

Q.—"And the whole thing is going to collapse"?

A.—No, I did not say the whole thing was going to collapse.

Q.—You did not think that?

A.—No.

Q.—Had you confidence in Mr. Lewis?

A.—I had never met Mr. Lewis in my life before.

Q.—Had you confidence in Mr. Lewis.

A.—I could not express an opinion of a gentleman whom I had never met or knew nothing of before.

Q.—How long were you seeing Mr. Lewis—for how many weeks?

A.—I was there from the 1st December, 1922, to the 20th January, 1923, and I saw him many times during that period. I went to his office and had interviews with him.

Q.—Having seen him many times are you not able now to express an opinion about him?

A.—My opinion is that he was not in a fit state of health to be carrying on the work.

Q.—That was October, 1922—fifteen months before the dredger began to work?

A.—In December.

Q.—In December—January—twelve months before the dredger began to work?

A.—Yes.

Q.—Did you urge upon Sir George Buchanan that Mr. Lewis ought to go?

A.—In my opinion——

Q.—Did you urge upon Sir George Buchanan that Mr. Lewis ought to go? That is the question.

A.—That he should have leave. I did not suggest to Sir George Buchanan that he should go. I suggested that a man in his condition of health, as I saw it, should have a prolonged leave.

Q.—With all this terrible expenditure of money we cannot afford to indulge in sentiment. We have to look at the thing brutally.

A.—Absolutely.

Q.—Mr. Lewis was the representative chosen by Sir George Buchanan. Sir George Buchanan vouched for him, did he not?

A.—He chose him.

Q.—He vouched for him?

A.—By choosing him.

Q.—Exactly. Nobody can avoid feeling ill. Your opinion in December, 1922, was that Mr. Lewis was a man too ill to do this responsible work. That is right, is it not?

A.—That is so.

Q.—And you urged that upon Sir George Buchanan. You appreciated, of course, that if the work was a failure, the very presence of Mr. Lewis there would, to some extent, involve Sir George Buchanan?

A.—I do not quite see that point.

Q.—Would not people turn round and say, " Well, this work has been a failure. It has been a failure partly because Mr. Lewis was not a big enough man for it. Sir George Buchanan appointed him." In that way it would reflect upon Sir George Buchanan, would it not?

A.—I do not know that it would. I do not see that point at all.

Q.—Very well. There is another and wider aspect of it altogether, and that is that Sir George Buchanan was the technical expert adviser to the Government, was he not?

A.—He was engineer for the work—technical adviser for the work.

Q.—With a responsibility to communicate to the Government anything that he considered of importance?

A.—Yes.

Q.—Was the state of Mr. Lewis's health a matter of the greatest importance?

A.—I consider it was a matter of importance. Mr. Lewis had, of course, a senior over him, but at the same time, as far as I could see, he was the executive in charge of the work.

Q.—He was the resident engineer?

A.—And he therefore should have been a man in the very best of health.

Q.—Exactly. When you urged upon Sir George Buchanan that Mr. Lewis ought to have long leave, what did Sir George Buchanan say about the matter?

A.—He quite agreed.

Q.—Did he go off to the Governor at once?

A.—I cannot say what he did.

Q.—Do you know whether he did?

A.—I do not know.

Q.—Do you think he did?

A.—I believe he took the matter up with the Government, but I have not the papers on that matter with me.

Q.—Do you agree that the increase in prices of plant and material between 1912 and 1919 was at least two-and-a-half times?

A.—In England?

Q.—Yes, in England?

A.—Yes, about two-and-a-half times I should put it roughly.

Q.—We have had figures given us by Colonel Paddon which have all been set out in detail. He thinks two-and-three-quarters times. Sir George is willing to go to two-and-a-half times. Had you any previous experience of reclamation on an open sea front in 1922?

A.—I have had experience.

Q.—Where was that?

A.—During my service with a firm in which I am now partner, which commenced between 25 and 30 years ago. There passes through my mind two works carried out in that time involving sea walls with reclamation behind, and during the period I was with contractors, amounting to about 10 years, there was a reclamation carried out which involved the construction of a rubble mound and reclamation behind it, also on the sea front.

Q.—With suction dredgers, or bucket dredgers?

A.—In that case the dredger was a bucket dredger with a shore pumping station. The material was actually pumped into the reclamation behind the wall.

Q.—You had a bucket dredger, and what we might call a booster?

A.—No, not a booster—a shore pumping station.

Sir Frederick Hopkinson.—The dredger dredges the material, and it is put into barges, which are taken alongside the wall, and it is pumped from there on to the reclamation.

Chairman.—Was that how it was done?

A.—Yes.

Sir Frederick Hopkinson.—It was not clay or sand?

A.—It was river silt and mud.

Q.—Sand?

A.—Not sand.

Q.—Not clay?

A.—No; river silt and mud.

Q.—Silt?

A.—And mud.

Sir Frederick Hopkinson.—Silt contains mud.

Chairman.—I am only asking you that, because I see that you have expressed an opinion about the price of reclamation. Do you remember that, on page 29 of the report, Sir George Buchanan estimates that the dredging will cost 8 annas a cubic yard?

A.—Yes. 8 annas a cubic yard, I think, is his price.

Q.—Do you approve that figure?

A.—I approve that figure.

Chairman.—Would you mind just taking down a figure or two? Would you put down £732,000. That is the price of the " Sir George Lloyd ", the " Colaba " and the pipelines. Would you put down £180,000; that is the price of the " Kalu," her repairs and her pipeline. Would you put down £10,000, which is the price of the " Jinga ", and you might put down £10,000 for her repairs, as she has been in dock for about 16 months.

Sir Frederick Hopkinson.—I think you can put down £40,000 for that.

Chairman.—Is that your view, Sir Frederick, that that is what the " Jinga " is going to cost?

Sir Frederick Hopkinson.—Something like that.

Chairman.—(*To the Witness.*) Put down £40,000 for that. Will you add all that up. How much does it come to?

A.—£952,000.

Q.—Will you tell me how many 8 annas there are in £952,000?

A.—I am afraid I must have misunderstood your question. I thought you were referring me back to the 1919 estimate.

Q.—We are coming to that in a moment. Would you tell me how many 8 annas there are in £952,000, or would you like me to do it for you? I will do it in two ways for you. Am I right in thinking that, if you take Rs. 15 to the £., the amount is 28,560,000 8 annas in £952,000?

A.—I do not make it the same figure, but I will accept your figure for the purpose.

Q.—I want to get it right. There are 28,560,000 8 anna pieces in £952,000. Now if you take Rs. 12 to the £ you will find there are 21,848,000 8 anna pieces in £952,000. Sir George was proposing to dredge 25 million cubic yards, was he not?

A.—25 million cubic yards is the figure in his report, yes.

Q.—He had exhausted all his 8 annas in the plant, had he not? It had all gone?

A.—I am afraid I cannot quite see that, because the figure which you have given me at the present moment, as I understand, is the actual cost of the plant?

Q.—Yes.

A.—His report was based—

Q.—On his estimated cost of the plant.

A.—Which was based on an estimate by a dredger builder in 1919

Q.—So be it.

A.—And the figures, as far as I have gone through this report, set out here that the charge of the plant amounts to 3·92 annas, based on an actual estimate made by the firm of dredger builders.

Q.—Quite so, and then, if there was an under-calculation on the estimate of plant required, we know that the actual fact is, as set out in these figures, that that dredging plant—the " Sir George Lloyd," the " Colaba," the " Kalu," the "Jinga," pipeline and accessories—came to £592,000. That being so, the whole of the 8 annas is exhausted in the mere purchase of the plant, is it not?

A.—Undoubtedly—the price that the plant actually cost. It cost two or three times as much as it would have cost in 1919 owing to the rise in prices in this country after the war.

Q.—You are not quite exact about that, but still. You say that the working cost of dredging a cubic yard of material from the harbour or Back Bay and putting it into the reclamation will be 8 annas, do you not? You agree?

A.—You are now talking about Sir George Buchanan's report. Is that right?

Q.—I have now got on to page 8 of your report on which you say : " I feel disposed to accept the figures given by the deputy Chief Engineer, Dredging, in evidence as to the present cost, that is, 8 annas per cubic yard. This cost is the result of working the dredgers." If it is going to cost 8 annas per cubic yard—and assume for the moment that 21 million yards still have to be reclaimed—you are going to spend another £800,000 on the mere working cost alone, are you not?

A.—That is 8 annas by 21 million cubic yards?

Q.—It is 21 million 8 annas?

A.—Yes. I was just looking back to see what I made it on the basis of 7 annas.

Q.—Rs. 10½ million.

A.—I take that figure.

Q.—Rs. 10½ million is rather a staggering amount, is it not?

A.—Compared to the quantity to be dredged, I do not think so.

Q.—Compared to Sir George Buchanan's estimate that the whole of the work could have been done for 367·61 lakhs?

A.—Had it not been for the increase in prices from 1919 onwards.

Q.—But Sir George disputes it. He is willing to accept it with some reservation that the price went up to 668 lakhs in February, 1922. If you are paying £952,000 for your dredging plant; £350,000 for your other plant; if you are going to pay Rs. 10½ million to reclaim the remaining 21 million cubic yards— those three sums are out of all proportion to the 367 lakhs, are they not?

A.—I do not agree.

Q.—Would you like me to take you through the arithmetic?

A.—My whole point is this, as far as my evidence can go—that looking back on Sir George Buchanan's estimate, 1919, I know from my own experience of works during the subsequent years that there was a very great increase in prices all round, and therefore any estimate made in 1919 must, in my opinion, be increased by at least 50 per cent. to give a proper idea of what the work would actually cost.

Q.—Increase it by 50 per cent. 50 per cent. on 367 lakhs brings it up to about 550 lakhs?

A.—Yes.

Q.—Take 550 lakhs. Sir Frederick Hopkinson has pointed out to me that if your figure for dredging cost is right, 8 annas per cubic yard——

A.—Not my figure. I am taking this figure from the deputy Chief Engineer's evidence—this figure of 8 annas per cubic yard.

Q.—Mr. Halcrow, you have put your signature to a document in which you say "I feel disposed to accept the figure."

A.—I feel disposed to accept it.

Q.—And I feel disposed to ask you, under the circumstances, whether the estimate of 367, even if increased by your 50 per cent. to bring it up to 550—whether that estimate of 550 lakhs was not a ludicrously low estimate in view of what has been found to be the necessary cost of the work—a ludicrous estimate?

A.—I do not agree.

Chairman.—I have nothing more to ask you.

Sir M. Visvesvaraya.—May I ask what you propose to establish by this note? What are the main points you want to put forward for the consideration of the Committee?

A.—I say for the consideration of the Committee, from my visit to Bombay I formed the opinion there that as far as the wall work was concerned they were doing the work pretty well. I have been accustomed to contractors' methods, but their methods were strange to me. Making allowance for conditions I did not understand, I thought the wall was getting along fairly well. At the same time I formed the opinion that they had been rather extravagant in the provision of plant for the work, and I could have done the work with less plant myself. There were various items of organisation there with which I became acquainted which were strange to me. They did not appear to have much co-ordination amongst the senior members of the staff. These are the impressions I formed when I was out there.

Q.—I understand you are making some definite recommendations or suggestions in this statement?

A.—In the light of what has happened since 1924 my personal opinion is that it is very much better that the work should be completed on a contract basis.

Q.—It can be completed on the estimate already sanctioned?

A.—I have taken the figures which have appeared in the evidence, not having any other figures to go on.

Q.—The evidence is of various kinds. Some people say one thing, and others say another. If you accept one person's view and calculate on that only you may get a certain result.

A.—I think it is very difficult, but on page 16 of my notes you will see what I say. The figure for last year's working of the dredger was, I believe, 1,800,000 yards for the "Sir George Lloyd," and they state that they were only working 16 hours a day instead of the customary 24. By working 24 hours that would put that figure up to 2¾ million cubic yards, without increasing the intensity of the volume, if you follow me,—simply at the pace at which they have been carrying on. That brings it up to 2¾ million cubic yards per annum; but in my opinion, that output can be greatly increased—in fact, the members of the Development Department who are carrying out the work say so themselves. They say in their evidence that they could increase it. Then as regards the "Kalu" working in Back Bay, she is reported to have dredged last year 338,000 cubic

yards in 2½ months. In six months, I take it, she could do 800,000 cubic yards, and if put on full working time it would bring it up to 1,200,000 cubic yards. Adding those two figures together without allowing for any improvement in intensity of output due to organisation, those vessels could dredge 4,000,000 cubic yards in the season.

Q.—Have you also seen the evidence given by Mr. Spiers when he says you cannot work it in the same way at night time—you cannot do as much work at night time as in the day time?

A.—I must disagree with Mr. Spiers. My experience of dredging in works I have been connected with is that they have always worked 24 hours a day in two shifts, either 132 hours or 144 hours per week. It is either 5½ or six day of two shifts.

Q.—Contractors work that way?

A.—Contractors always work 24 hours a day, and it is very well known to the staff out there. They know that very well indeed. They are men with experience on the staff of contractors. They have had experience with eminent firms of contractors.

Q.—Then why did not they themselves suggest working 24 hours?

A.—That is absolutely beyond me. I cannot understand it.

Chairman.—We asked the same question.

A.—Yes. To me it is inexplicable altogether. I do not understand why they did not start right at the beginning.

Sir M. Visvesvaraya.—It may be because they did not want to take the trouble of making the work.

A.—It may be that. I do not know what the reason was. It is a fact that they know it, because I personally know the deputy dredging engineer, and I know that for years he was engaged on a dredging contract in this country where they worked 132 hours per week. In fact, I considered that is so important that I put it in my statement.

Q.—You have taken all the favourable items from the evidence and developed this note?

A.—I hope I have not taken the most favourable items, because I think in the evidence the deputy dredging engineer says he could get 2,000 cubic yards an hour out of the " Sir George Lloyd "—for a month, I think he said.

Chairman.—Will you show us where, because we should like to see that? The " Sir George Lloyd " did something reasonably well when she got into an extremely favourable patch of soft clay and soft mud. If you can show us that in the evidence we should be glad. We want to find what is your authority for your statement about the " Kalu " doing a certain dredging output, and the statement on the last page of your statement here. We would like to see that in the evidence, and where it comes from.

A.—I have not got a copy of the evidence.

Sir Frederick Hopkinson.—You say on page 16 that the " Kalu " is reported to have dredged 338,000 cubic yards in 2½ months.

A.—Yes.

Q.—Where does that report come from?

A.—Speaking from memory, it comes from Sir Lawless Hepper. I shall have that searched for.

Chairman.—Would you kindly look up that point about the " Kalu," and let us have it within the next two or three days?

A.—Certainly I will do that. I shall endeavour to let you have it before then.

Q.—There is the point about the " Kalu," and the point on page 20 : " The Development Department staff have admitted this to the Committee." " The dredger ' Sir George Lloyd ' if properly handled can give her designed output in the material in the harbour "?

A.—Yes; I can find that also.

Q.—Do you mean by that that some one witness has said that? Do you mean a witness like Mr. Brims has said : " I think she could give her output." Is that what you mean by the Development Department staff have admitted this?

A.—That is right.

Q.—You mean some member of the Development Department staff has said it?

A.—One of the senior members, I think it was. Probably the deputy chief engineer in dredging, I think they call him.

Q.—Mr. Brims?

A.—Yes.

Q.—We will have a look at that.

A.—Yes; that is it.

Sir Frederick Hopkinson.—The maximum they told us they could possibly hope for from the dredger this season was 1,600,000 yards, and that is what they were going to base their calculations on.

A.—Really.

Chairman.—There is some mistake about this, you will find. Mr. Brims may have made some statement like that, but if you look at the whole of Mr. Brims' evidence you will see that it obviously does not bear it out. We want to know about the statements on page 16 and page 20 of your note.

A.—Yes; that is the "Kalu's" output of 338,000 cubic yards, and Mr. Brims' statement that 2,000 yards an hour can be obtained from the "Sir George Lloyd."

Sir Frederick Hopkinson.—He is the man who is responsible for getting 2,000 yards. Why should he say that he could get 2,000 yards in the future when he has never been anywhere near it in the past? Can you understand that?

A.—It is difficult to understand.

Q.—It is impossible to understand. He is paid to do it.

A.—I have put my views in here, and I will not allude to that.

Q.—You do not think he is hanging up a flag to say: "I am paid to do 2,000 yards, and I can only do half that."

A.—I do not know.

Sir M. Visvesvaraya.—On page 1 you say: "The firm had to invite tenders and examine and report to the India Stores Department upon the tenders for any plant which the Development Directorate desired to purchase in this country." I suppose you recommended which tenders should be accepted in every case?

A.—That is right.

Q.—This was the only occasion which you visited the works in Bombay—in 1922?

A.—That is the only occasion, 1922-23.

Sir M. Visvesvaraya.—On page 2 you say: "I was particularly anxious to see the detailed programme for working the dredging plant, but failed to obtain any information as to whether a programme had been prepared or not." You say you did not ask for a programme?

Chairman.—He said he did ask, but could not get an answer.

Sir M. Visvesvaraya.—Did you ask officially and get a reply?

A.—This was an interview with the chief engineer.

Q.—I think he has said he was not asked, but you have a recollection that he was?

A.—I can only put down here the result of my interviews, because Sir George Buchanan was in Bombay, and, of course, I was only there as one of the staff of the firm.

Sir Frederick Hopkinson.—If you told Sir George Buchanan that they had not got a programme at that moment, surely he would have turned round and said: "But I made one myself and sent it out last year"? He sent out a full programme in April, 1921, for the dredging operations.

A.—I do not recollect any conversation on those lines. I am speaking now entirely from memory of four years ago.

Sir M. Visvesvaraya.—You may send out programmes, but did you see in your office that the programmes were being given effect to?

Chairman.—At that time, in 1921, he was not associated with the work.

A.—Before October, 1922, I may say I knew nothing whatever about the Back Bay work at all. I was engaged on other works in other parts of the world. I merely knew that that work was going on, and that is all; so that I am not able to speak of anything before that date.

Q.—Subsequently have you been sending out programmes from your office and insisting upon their being observed on the spot? Did you send out programmes, or did you suggest to the engineer, or discuss with him, programmes for adoption?

A.—I wish to make my position in connection with Bombay quite clear. Sir George Buchanan was either out in Bombay or he was back in this country. When he was in this country he dealt with all these matters. From time to time he may have discussed matters with me in order to obtain my opinion on one point or another.

Q.—Did you follow the correspondence?

A.—I have not necessarily followed the correspondence because I have my own work to do and my own clients to attend to, and I dealt with matters of Bombay when Sir George Buchanan wished me to. If perchance he was not in England then I would have to deal with the matters in detail.

Q.—This is a very important point, as to whether you were sending out programmes for the execution of the work, and whether they were being acted on by the people on the spot.

A.—The only definite case which I can remember that I myself had looked into was the question of dredging in Back Bay. In that case what happened was, I think, that Mr. Brims was appointed as dredging engineer, and before he went out I showed him my ideas as to how the Back Bay dredging could be tackled. Actually they did not adopt that suggestion.

Q.—Passing on to page 6, you have made this statement: "I learned that the senior members of the Department did not avail themselves of his knowledge and experience "—that is as to Mr. Settle?

A.—Yes.

Q.—Did he give his knowledge and experience in writing?

A.—When he was out there he told me that for the most part he was left—I do not know that I should tell you very much what he told me because he is going to give evidence, and it is better that I should not repeat what he said to me; but it has an important bearing on it.

Q.—" I learned that the senior members of the Department did not avail themselves of his knowledge and experience."

A.—He will explain all that.

Q.—On page 8 you say: " It is difficult to believe that the dredging cannot be carried out at about the rate of five annas estimated by the Development Department themselves, working full time." So that you are of opinion that they can do the dredging at 5 annas even now?

A.—It is based on this—that they have been working the dredgers 16 hours a day instead of 24 hours. It will lessen the cost at once when they work 24 hours.

Sir M. Visvesvaraya.—When you say that the dredger works 16 hours, does not it mean that it works sometimes 18 or 20 hours, and sometimes 20 to 22 hours, and the time they do the pumping is 15 hours?

Chairman.—No; 11 hours, 40 minutes.

A.—When I talk about the working time of the dredger I am talking of the gross working time, not the net actual pumping time which was estimated, as I see in Sir George Buchanan's report, at 15 hours per day. You may take it that I would expect to work 24 hours a day in order to get 15 hours net.

Sir M. Visvesvaraya.—They were working longer than 15 hours already.

A.—I understand that they are working 15 hours a day

Q.—Probably due to stoppages—they have not been working very satisfactorily—the number of hours' work is 18 to 20 hours, they told me.

A.—Really, I was not aware of that.

Chairman.—The average pumping rate is 11 hours, 40 minutes for the last season.

A.—That is the actual pumping time?

Q.—Yes.

A.—That is out of what?

Q.—It does not matter what it is out of. The fact is 11 hours, 40 minutes was the net pumping time.

A.—Very well.

Sir Frederick Hopkinson.—Even then that ought to have given twelve-fifteenths of 2,000 yards an hour.

Sir M. Visvesvaraya.—Did you see any of the clay when you went there?

A.—When I went there, they brought up a small sample from the bed of the Harbour.

Q.—15 hours pumping time you calculated as the average number of hours pumping time?

A.—Which 15 hours is that?

Q.—It is on page 10: " Two points only need be mentioned to prove mishandling: (1) the dredgers had not, even by the end of the second working season, been put on their full working time of 24 hours a day "?

A.—That is in order to get 15 hours' pumping time a day—actual pumping hours.

Q.—Had you advised them at any time that they should work 24 hours a day before that date?

A.—Before which date?

Q.—Before they commenced the operation?

A.—I personally advised them about it? I had no authority—I have no recollection of it.

Sir Frederick Hopkinson.—When you were out there in 1922, did you not give them instructions that they ought to work 24 hours a day?

A.—I personally did not.

Sir M. Visvesvaraya.—When did your firm advise full working time of 24 hours a day for the first time?

A.—These matters are all dealt with by Sir George. He was actually there giving advice.

Chairman.—He says Mr. Brims went out with definite instructions to work 24 hours a day.

Sir Frederick Hopkinson.—That was in the very early days. From that time there is no reference, I believe, in any letter or correspondence of any kind that they were to work 24 hours a day.

Chairman.—I do not think this gentleman ought to be asked about these matters. These are all foreign to him. That is how Sir George puts it, and no doubt it is quite right. Mr. Brims was told to go out and do a working day of 24 hours a day, which he never did. Sir Frederick says there is a curious silence in the correspondence about it afterwards; but you would not know anything about that.

A.—No. It might help to get matters through more quickly if I mentioned the points which do appeal to me very much.

Sir M. Visvesvaraya.—Certainly.

A.—In February, 1925, when Sir George did not come home as he usually did after his visit to Bombay, I felt it incumbent upon me to look into the matter of dredging. I went through the reports which were sent down. I waited a week or two to see whether there was any direct improvement as a result of Sir George Buchanan's visit out there. I found there was no improvement, and therefore I addressed a letter to the Development Directorate asking for an explanation why the dredgers were not getting the specified output. At the same time I asked them—it was rather a bow at a venture—to let us know what bonus terms they had arranged with the crews. The reply they gave us was that they had not arranged any bonus terms with the crew at all, although they were then in their second season of dredging.

Sir Frederick Hopkinson.—The third season, was not it?

A.—The second season.

Q.—When Sir George went to Australia it was the third season?

A.—No, the second season.

Chairman.—It is 1923-24 and 1924-25; and then Sir George goes to Australia. 1923-24 is the first season of dredging?

A.—Yes.

Q.—1924-25 is the second season?

A.—Yes.

Q.—It was on January 7th that Sir George Buchanan went off to Australia, in the middle of the second season?

A.—That is right.

Q.—Then he being absent, you took the matter up?

A.—He being absent I took the matter up at that point. As I have just said, I found that they had not got any of their crews on the basis of payment by results. To my mind that is a terrible thing. I do not know that I can say more. Letters were exchanged. They admitted openly that they did not have the dredgers on the bonus. When Mr. Brims came home on leave the following summer and came to see me, I asked him particularly about that point and said: "Have you ever known of the case of a big dredging contract being carried out without payment by results?" And he said "No."

Sir M. Visvesvaraya.—On page 16 you say: "Viewing the dredging as a whole, notwithstanding the methods adopted by the Department in handling the plant, they had accomplished about 4,000,000 cubic yards of filling out of a total of 25,000,000". That 4,000,000 cubic yards is in three years?

A.—Yes.

Q.—As against 15,000,000 expected?

A.—Expected from the plant, yes; but not so much as from their own project estimate. Owing to Sir George Buchanan's personal representations, they started a year earlier than they intended. From their estimate they intended to start in the year 1924-25 and to do 10 per cent. of dredging.

Sir Frederick Hopkinson.—Mr. Lewis said they intended to start in 1923. He said distinctly: "Not an ounce will be done before December, 1923"?

A.—I am referring to the programme of work.

Q.—I am referring to the letter. What is it you are referring to?

A.—To the long statement which is entitled " Programme of working and probable annual expenditure "; and under the year 1924-25, item 12 dredging 10 per cent.; and in the year 1925-26, 20 per cent.

Mr. Billimoria.—Actually Sir George Buchanan told them they ought to begin in 1922, and Mr. Lewis replied: " Not an ounce will be done before December, 1923 ".

Sir Frederick Hopkinson.—That was subsequent to that.

A.—Subsequent to this programme?

Q.—Yes, that programme was in course of preparation for twelve months. It may have been in the last month of the 12 months that they put that in. That has no value at all.

A.—Well, this is the document that I have always gone by.

Q.—It is of no value at all?

A.—So far as my connection with the work is concerned, it is their final programme.

Sir M. Visvesvaraya.—You advise 24 hours' work?

A.—Absolutely.

Q.—Would you do it in two shifts or three?

A.—My experience has been in two shifts, but that is a matter of detail. Some people prefer to work three shifts.

Q.—Then on page 17 you say: " The firm were appointed Engineers. They prepared plans and specifications of the permanent work in accordance with the practice of the profession and inspected the carrying out of the work ". You have a definite understanding, according to your contract with the Government. The contract requires you to perform all works and duties devolving upon Engineers of large works such as the final provision and inspection of estimates and prices and tests and also trials of dredgers. In fact the final inspection and supervision of the tests and trials of the dredgers were not attended to. The trials of the operation of the dredger have not been attended to. I do not know whether you know that? The firm prepared the original estimate; but what else did you do in the way of preparation of plans and estimates after the original estimate? Is there any document comparable with that report prepared at any later stage, or any important work that your firm did in the matter of reporting on plans and estimates after this report was submitted? Do you follow me?

A.—I have not quite caught that.

Q.—This report was first submitted in 1919?

A.—Yes.

Q.—After that is there any report submitted by your firm or by Sir George Buchanan comparative with this?

A.—To the Bombay Government?

Q.—Yes, any important plans or estimates, or any report like this?

A.—The plans which I have seen were working plans for the wall and specifications as to what had to be done.

Chairman.—And Sir George Buchanan's annual reports?

A.—Yes.

Sir M. Visvesvaraya.—But the specifications of the wall were not adopted on the spot. The engineers there did not follow exactly what was described there?

A.—To a certain extent they departed from the specification, but in the main I should say not.

Q.—In the main they adopted them?

A.—In the main, yes, but there were certain details in my opinion in which they were not adhering strictly to the specification.

Q.—Then on page 18 you say: " Sir George Buchanan has dealt with this matter in his statement. Personally I should have preferred that the firm had had a separate Resident Engineer under their direct control "?

A.—Yes.

Q.—To faithfully carry out the terms of the contract, would it not have been necessary to have a separate Resident Engineer of your own on the spot?

A.—I think not, from what I recollect of the contract.

Q.—Measurement and inspection—all the work that is usually done by the engineers. It is stated here in the contract that your firm is expected to do all the work which engineers reckon to do on a work of this kind?

A.—Yes.

Q.—Without a Resident Engineer, how could you do it?

A.—As I found things when I got there and had the position explained to me, the position was that the Resident Engineer really had a dual position. That is why I state here that I did not like it.

Q.—Should not you have had a separate Resident Engineer?

A.—That point was discussed when I was in Bombay, and I believe Sir George Buchanan has dealt with that in his statement. In fact I have seen that he has, as I have read it. He refers to meetings which took place out there at which the Government said: "Why do not you have your own Resident Engineer?" He said he was perfectly willing to have his own Resident Engineer.

Q.—But they would not pay for the man?

A.—No.

Q.—On page 19 you say: "The former"—that is the sea-wall—"is over 90 per cent. completed and the design has proved to be satisfactory. The latter is 16 per cent. completed, and, as I have endeavoured to show above, there does not appear to to be any physical reason why the remaining dredging should not be done with the plant available within the time estimated by the Development Directorate, namely, the summer of 1931." You say: "There is no physical reason." Yesterday Sir George Buchanan stated that you can bring the work to a triumphant conclusion if regard is not had to the cost. In both these cases you do not go into the question of cost at all?

A.—You mean as to whether the Government should spend the money in completing the work?

Q.—Yes?

A.—I do not express any opinion on that at all. From the figures I have given on another page in my statement I have endeavoured to show that, without any increase in the intensity of the work of the dredgers, that is to say, which would be obtained by the payment of proper bonuses to the men, in my opinion they can carry it out within that programme which they themselves have prepared ending in 1930-31.

Q.—You have assumed certain figures and made calculations and shown that, if I may say so without seeming discourteous, to your own satisfaction?

A.—I will not say to my own satisfaction at all. I myself would like to see them greatly improved upon; but I have taken the figures from the evidence for the working of the dredgers in 1926.

Q.—You have not taken account of the fact that you cannot dredge on the middle blocks. You cannot send the stuff to the middle blocks 1 and 2. You cannot pump that distance with the present plant.

A.—Really?

Q.—The Engineers on the spot say so, and everybody says that.

A.—I have not gone into that. I quite understood that the plant was provided for the whole work.

Sir M. Visvesvaraya.—Your statement is too optimistic almost to be discussed.

Chairman.—You cannot treat this seriously?

A.—Yes, I think so.

Q.—Are you treating it seriously?

A.—Yes. I should be sorry if it would not be treated seriously.

Q.—I am sorry to have to express the opinion, but it is so utterly optimistic, and flies in the face of all the evidence we have heard in Bombay, that it seems to me it is a mere academic hopeful opinion.

A.—I have taken the figures from the evidence which has been given.

Chairman.—I agree.

Sir Frederick Hopkinson.—In other words, you have done the dredging in this room, or in your own office.

Chairman.—As a practical proposition, it is no good.

A.—I have endeavoured to be fair by taking the figures from the evidence given. I have not put what I thought ought to be done. I have not even assumed that they could do more than 1,000 yards an hour, which they have been doing with the dredger. I have taken the figures they have given and divided it up into the work done.

Q.—Multiplying it by one or two things?

A.—I think not, only 24 hours against 16.

Sir M. Visvesvaraya.—Will you pass on to page 20, where you say: "The action to take would have been to refer the matter to the engineers for the work for their opinion and report"? Did your firm ever give anywhere a detailed estimate themselves? You say that they should have submitted for your consideration the working out of the estimate?

A.—Yes. I see what you mean. I understand this is the estimate of the Advisory Committee?

Q.—Yes. You say you wanted that estimate to be sent to you for criticism?

A.—I think they should have submitted it to Sir George.

Q.—There has been criticism enough. What they wanted was constructive work. Why did not you go there and prepare estimates and hand them over?

A.—This is historical so far as I am concerned. It is before 1923. I understand that Sir George did prepare an estimate.

Chairman.—There is only 5 per cent difference between them.

Sir M. Visvesvaraya.—We have no details of that.

Chairman.—It is 668 against 702; there is no real difference.

Sir M. Visvesvaraya.—He takes the figures and makes up a rough estimate. The totals are of his original quantities he picks out here and makes a general statement, but that is not a detailed estimate. What is required is a detailed estimate for guidance in the execution of the work. Such an estimate has not been given. If you can show me such an estimate I should be glad.

Chairman.— It is common ground that he has not. There is no estimate except the one appended to the report, accompanied with the fact that Sir George's estimate worked out at 668 lakhs. It was a very good estimate so far as it went. The project estimate which before us is only 702 lakhs, a difference of 5 per cent.

Sir Frederick Hopkinson.—The only thing I should object to in what you say is the use of the word " estimate."

Chairman.—Anyhow, there was no substantial difference in February 1922 between Sir George and Mr. Lewis as regards the ultimate price?

A.—There was no substantial difference.

Q.—668 in February 1922, and 702 in October 1922, which is a difference of about 5 per cent?

A.—Yes.

Q.—There is nothing in it?

A.—No.

Sir M. Visvesvaraya.—With regard to the dredgers, you have not given any concrete examples of other dredgers of similar design which have been working quite satisfactorily. You have not given any calculations for the "Hotspur," and on what basis you prepared your designs. To show the confidence placed in the present dredgers is not misplaced, you assume that the dredgers will work all right, then you assume the rates will be low, and then you make up the figure.

A.—On what they have actually done.

Q.—What would you expect to do hereafter—5 annas? That is what you expect hereafter as the rate?

A.—They give the actual cost at a rate of about 8 annas a cubic yard. I expect with the dredger working for 24 hours a day instead of 16 hours a day, and put on a system of payments by results, to get a much greater output, and the result would be, of course, that the cost per cubic yard would go down.

Sir M. Visvesvaraya.—You have overlooked what the plant has been able to do hitherto, and you have overlooked the fact that she has to dredge hard material. That comes into it. Then there is the distance. It cannot go into a certain area. All those things have not been taken into consideration, and I am afraid other important factors have not been taken into consideration.

Chairman.—There is no doubt that is so.

Sir Frederick Hopkinson.—Where was this pumping ashore dredging work that you have told us of?

A.—At Pria in the Straits Settlements.

Q.—What did that cost?

A.—I was not on that work myself. I was on a similar contract some miles away, and I visited that work periodically. Although it was being carried out by the same firm at the same time, I was not intimately acquainted with the cost of that dredging.

Q.—What was the similar work you carried out?

A.—That was on another contract, but that other contract did not include reclamation works.

Q.—You have had a lot of experience of dredging?

A.—I have had experience on the different contracts on which I have been.

Q.—Do you mind telling me one or two of them so that I may make a note, suction pump cutter dredging?

A.—No.

Q.—No experience?

A.—I have not worked a suction cutter dredger myself.

Q.—Therefore you cannot tell us what has been the cost of such works from your own experience?

A.—Not from my own experience except the Back Bay work.

Q.—From your own experience?

A —Outside Back Bay?

Q.—Yes.

A.—Not outside of Back Bay.

Q —Your experience of Back Bay was limited to seven weeks at the end of 1922?

A.—My visit there.

Q.—Was that when the dredgers were not working?

A.—Yes.

Q.—So that you do not know anything about the dredgers at Bombay except what you have read?

A.—What I have read and heard about it. I have endeavoured to make that clear from the statement.

Q.—I want to get it quite clearly?

A.—That is perfectly clear; that is quite right.

Q.—You have no personal knowledge of the dredging at Bombay?

A.—Except what I have been told by other people.

Q.—Just so yes or no. It is quite a simple question.

A.—No personal knowledge out in Bombay?

Q.—In Bombay?

A.—No.

Q.—And no other personal knowledge of any suction pump dredging?

A.—No.

Q.—Can you tell me what percentage one ought to expect to get from a pump dredger of solid material?

A.—You are doing well if you can get 15 per cent.

Q.—What material is that in?

A.—In mud.

Q—Anything else?

A.—Clay—good cutting clay.

Q.—You say you are doing well if you are doing that, but what I want to know is what could you reasonably expect to do as an average output?

A.—In those materials?

Q.—Yes, or in any material you like?

A.—I have not got any figures, but I could bring a lot up. You are asking me my opinion.

Q.—I ask you if you can tell me what one has a reasonable right to expect?

A.—12 to 15 per cent.

Q.—Do you know where you have ever got 15 per cent, or where it has ever been got?

A.—In this Back Bay work—I do not want to encroach on Mr. Settle's evidence. Mr. Settle has brought home a lot of his tests made out there.

Q.—We have got those; we will criticise those afterwards.

A.—Yes.

Q.—Can you tell me where 12 to 15 per cent. has ever been obtained?

A.—I think I could find that from my note; I could search.

Q.—You cannot tell from memory?

A.—I am afraid I cannot.

Q.—You have had no experience of it; therefore it will be only something which you have learnt somewhere?

A.—That is right.

Q.—The evidence that has been given before us has been consistently to the effect that if you get 10 per cent. average output you are getting quite a good result. Have you any objection to that, or do you agree with that?

A.—I think it could be improved upon.

Q.—You think it ought to be improved upon?

A.—I think it ought to be improved upon.

Q.—But you have no experience to go upon. I feel rather a difficulty as you have no experience in asking you any questions about it. Is not it the fact that there is curiously little known about the work of suction dredging?

A.—I do not think I could agree with that.

Q.—Can you point out to me anywhere where reliable information on the work of suction dredgers can be obtained? You do not seem to know?

A.—I am certain I could find many references.

Q.—But you do not happen to know them?

A.—Not offhand, but I think there are many of them.

Q.—I suggest to you that there is curiously little known about it?

A.—Really.

Chairman.—We must try to add to the knowledge.

Sir Frederick Hopkinson.—We must, but at the present moment there is hardly any information available; the people who have done the work have kept it to themselves.

A.—I have some records in my office of suction dredgers.

Q.—I would like you to bring them this afternoon?

A.—Yes.

Q.—You say you have got them in your office. Would you mind bringing those this afternoon?

A.—I shall certainly bring them if I can find them in that time. I am rather surprised at the question, because I should have said offhand I could have picked up two or three papers on the subject of suction dredging.

Q.—That is what one would say. I can give you records, but they have not been published.

A.—Quite so. I am talking about published records.

Q.—I mean records that anyone can get at?

A.—That is what I am talking about. I will endeavour to find them, and let you have any papers, or at least the reference to them.

Q.—If I can have them by 3 o'clock, when we meet again, I shall be greatly obliged.

A.—Certainly.

Sir H. Courthope-Munroe.—I think it was suggested that we should put in letters of complaints by Messrs. Buchanan with reference to the output of the "Sir George Lloyd." I have before me a letter written by the gentleman in the Chair, Mr. Halcrow, and the following correspondence. It might be as well that you should have it, and that he should deal with it. (Documents handed in.)

Chairman.—Thank you very much.

(Adjourned for a short time.)

Sir Frederick Hopkinson.—Have you got those figures that you were going to get me of the outputs of the dredgers?

A.—I have not been able to complete the statement. It is being prepared, and as soon as it is ready it will be handed to you.

Chairman.—The two matters are with regard to the "Kalu" and the Development Directorate staff. They are referring to pages 16 and 20 of your statement, are they not.

A.—Those are a further two matters to which I am also attending.

Q.—Will you let us have them in time to-morrow?

A.—I have given instructions for them to be searched for. Here is some correspondence which has been handed in. There is a letter dated 26th February, 1925, to the Chief Engineer through the Director of Development. In this letter we draw attention to the low average hourly output of the dredger in the first paragraph, and, after going through certain facts, we come to the foot of page 2 and say: "As the output of the dredger and auxiliary craft so largely depends upon the dredging staff, you have no doubt arranged to pay bonus on the output, and we shall be obliged if you will let us have a copy of the bonus conditions, also particulars of the method of measurements adopted as the basis of payment and for weekly progress.*

Sir Frederick Hopkinson.—In connection with that we were told that the scale of bonus had been settled by Sir George Buchanan.

A.—Do you know when? In this correspondence, which takes us up to September, 1925, apparently no bonus had been arranged, that is to say, during the second season of dredging. The Chief Engineer's reply to that is dated 20th March, 1925, on page 4: "No bonus on the output has been arranged for this season owing to the fact that only one of the Assistant Dredging Masters has had any previous training, and I consider it would be throwing money away to fix a bonus at a low rate of output at this stage of the operations to enable the men to earn any bonus."

* See Appendix XVIII.

Q.—After that a bonus must have been arranged, because one of the witnesses said that he did earn a small bonus, and although it was small it was acceptable. That was his phrase.

A.—Was not that in the third season?

Q.—I say that it was after that. With regard to the question you raised about the "Kalu," they answered that in this way: "With regard to a weekly progress return for the 'Kalu,' as this vessel is only able to work for an hour or two a day every other week and her output is so very small being only about 225 cubic yards per hour." That was terrible, was it not? 2,000 cubic yards per hour was her guaranteed output and 225 her actual?

A.—That was the "Kalu"?

Q.—Yes.

A.—Her designed output, I think, was less than that of the "Sir George Lloyd."?

Q.—No, 2,000 yards. The difference was that she was dredging down to 40 feet instead of 70 feet, and she was 2,700 H.P. as compared with the 3,000 H.P. of the "Sir George Lloyd." She had the same guaranteed output of 2,000 cubic yards per hour in soft clay, and when she went on to this Back Bay work she did 225 cubic yards per hour.

A.—On the 23rd April, reference is again made in a letter from my firm to the Chief Engineer through the Director of Development. In the last paragraph on page 2 we again express an opinion on it: "As a bonus on the output has not been arranged, we consider it should be arranged even at this late period of the season so as to give the men concerned the assurance that their better effort and skill in working the craft will be rewarded. We are strongly of the opinion that the best output will not be obtained until a bonus is given and we therefore suggest that a start should be made at once with a reasonably substantial bonus to the Dredging Master (Mr. Spiers) and downwards."

Q.—That was 23rd April? That letter would not get there for a fortnight and that would take them up to about the 7th May?

A.—Just about the end of the season. They could not do anything practically in that season but they could prepare for the next one.

Q.—Which apparently they did?

A.—Yes. We have no information other than what is in the evidence taken in Bombay. The next reference to bonus is in a letter of the 23rd July, 1925, in which we state: "Further to the correspondence re output of the 'Sir George Lloyd' last season, we have had long conversations with Mr. Brims and have formed the opinion that the main causes of low output are the lack of incentive to the men in the form of a bonus on output, and also that there would appear to have been too much time spent on obtaining hard material at the expense of output which we consider of greater importance."

Chairman.—Were you able to form any view of Mr. Brims?

A.—His ability, do you mean?

Q.—Yes, his ability, his energy and his driving force.

A.—On one occasion he worked under me when I was with contractors and I formed a high opinion of him. He was a good worker.

Q.—His experience as regards dredging was when he was about 22 years of age, was it not?

A.—Oh, no.

Q.—He said so?

A.—I know for a fact that he was engaged for years on the main dredging contract at Rosyth. The dredging contract started there, I think, in 1913.*

Q.—That would be bucket dredging?

A.—It was all bucket dredger work, but it was all dredging work.

Q.—Sir Frederick Hopkinson put some very pointed questions to him in Bombay at the conclusion of his evidence, and we got a very fair idea of Mr. Brims' previous experience.

A.—That is a case of which I know definitely, because I had something to do with that contract.

Sir Frederick Hopkinson.—At Rosyth?

A.—Yes, and Mr. Brims was engaged on it. Then, in reply to that, the Chief Engineer, in a letter dated 8th August, 1925, with reference to bonus, states: "My idea is that a monthly bonus should be paid on *actual pumping time* only, exclusive of time spent in pumping water only, provided that measurements show that the quantity pumped is not less than say 900 cubic yards per hour."

Sir Frederick Hopkinson.—That is putting it very low, is it not?

Chairman.—45 per cent.

* See Appendix XX.

Sir Frederick Hopkinson.—They ought to earn a very handsome bonus indeed starting from that as a basis?

A.—They should do.

Q.—I should be inclined to put the bonus figure at 2,000?

A.—That is not my idea of bonus on a vessel designed to do an average output of 2,000. I should begin below that so that the men would work up to it. In reply to that we said, in your letter of the 16th September, 1925: "We note your suggestion that bonus should be paid on the *actual pumping time* and have given it our careful consideration. The idea is new to us, and while we realise that a bonus on this basis would make for an increase in the number of hours' pumping (with reservations regarding the quantity of material pumped) we are of opinion that better results would be obtained by adopting the more usual system of bonus on the *actual quantity of material dredged per hour.*"

Q.—Is it not the same thing?

A.—It does not appeal to me as being the same thing.

Q.—But it is? Surely you would not pay the bonus when the dredger was not pumping?

A.—The difficulty, to my mind, is working it out on a basis of the actual quantity pumped.

Q.—Spread over the pumping hours?

A.—In my opinion the better thing is to take the quantity dredged and divide it by the pumping hours, which is the actual quantity of material shifted.

Q.—Is not that what he proposes?

A.—It did not strike me as being the same thing at all.

Chairman.—You say he puts actual pumping time in the letter of the 8th August?

A.—Yes, that is what he writes.

Chairman.—It might be pumping water and not material.

Sir Frederick Hopkinson.—But the bonus is paid not on the time the dredgers are pumping, but on the output of the dredgers. Therefore it is the same thing. You are talking about precisely the same thing. You may call it pumping time or pumping hours, or what you like; the whole thing is that you are paying them on the output?

A.—But what he says here is, "Provided that the quantity pumped is not less than 900 cubic yards per hour."

Q.—Pumping time?

A.—That is the output per hour.

Chairman.—They would have a bonus for every hour of actual pumping time, provided that the measurements showed that during that time they were doing 900 cubic yards per hour. You said, "No, no, put it this way: never mind the time, look at the result"?

A.—Yes.

Q.—"Pay them a bonus on the amount they dredge"?

A.—Yes.

Sir Frederick Hopkinson.—But it must be regulated by the time.

Chairman.—In a sense, yes.

Witness.—The point was this, if I may say so. If they pumped for 15 hours per day, for example, and just cleared the 900 yards per hour, they would be paid the bonus. On my system, if they did 1,500 or 2,000 or 2,500 an hour so the bonus would increase. That is the difference.

Sir Frederick Hopkinson.—The bonus is to begin, according to this, after they have pumped 900 cubic yards an hour?

A.—He says, "Provided that the quantity pumped is not less than." He makes that reservation.

Q.—There is no bonus unless they pump as much as 900 cubic yards an hour?

A.—Yes, and as long as they go on pumping at 900 or more than 900 cubic yards an hour, for every hour's pumping they do, with that quantity of material being passed, so they gain a bonus.

Q.—I cannot tell unless I see the details of the scheme, but I take it that what he is suggesting is that the minimum rate before any bonus should be applied is 900 yards an hour. If they pump 1,000 yards an hour they will get a bonus on the 100 yards?

A.—I do not read it in that way.

Q.—I cannot read it in any other way?

A.—"Bonus to be paid on the actual pumping time in excess of 80 hours per week." That is the difference between the two systems.

Sir Frederick Hopkinson.—I cannot see any difference.

Chairman.—Your point is that the bonus begins to run from the moment that they touch 900 cubic yards an hour?

A.—Yes.

Q.—And it was calculated upon time?

A.—Yes.

Q.—Their suggestion was time?

A.—Yes.

Q.—Your suggestion was output?

A.—Yes.

Sir Frederick Hopkinson.—I should think there is no real difference between them. Can you tell me whether, in your experience, you have every known of work done at five annas a cube yard, including the cost of the machinery, where there have been double dredgers employed?

A.—On suction dredgers? No, I cannot give you any figures for suction dredgers.

Q.—In the middle of page 3 you say, " The complete lay-out of the reclaimed area had not originally been contemplated." Surely that cannot be true. The original lay-out, was contemplated and included in all the original estimates?

A.—I was not aware of it.

Q.—But you see it in Sir George Buchanan's estimate of 1919. He has got 75 lakhs in for it?

A.—This lay-out to which I refer is the lay-out by the town planner.

Q.—You mean the details?

A.—The complete lay-out of the reclaimed area with roads and recreation grounds.

Q.—You mean the final plans had not been prepared; but you say that it had not originally been contemplated. Surely it was contemplated and included in the estimate?

A.—I do not understand that it was.

Q.—What was the 75 lakhs for.

A.—I have not read in this report that that referred to the making of a new town.

Q.—There is no making of a town. It is lay-out. Here are the roads and drains. That is what has been called the development. What is the 75 lakhs for?

A.—I understand that the 75 lakhs was to cover the following. I am now looking back to the time before I had anything to do with it; you quite understand; but you are asking me a question on that. I think I have made it clear in my statement that this information came to me from questions which I asked when I first became connected with the work.

Q.—You see, it is all given in Sir George Buchanan's report of 1919. He has included a sum of 75 lakhs for it?

A.—At the time I came in connection with the work I asked what this was for, and he told me that this was for such drains as had to be made in connection with the reclaiming of the land and a proposed few roads, which was all to be determined later.

Q.—You have only to read it. It says " Roads, drains, lighting ".

A.—Roads, drains and lighting; that is right.

Q.—That is the lay-out?

A.—Not the lay-out on the lines which were ultimately decided on.

Q.—Never mind the lines; the original lay-out?

A.—But it makes a very big difference.

Q.—What does?

A.—To practically double the area at the lower end of Bombay.

Q.—That does not touch the point. You say it had not been contemplated. I point out to you that it has been contemplated and provided for to the extent of 75 lakhs—roads, drains and lighting?

A.—I refer to the complete lay-out. I say that the complete lay-out of the reclaimed area had not originally been contemplated. Those are the words which I use, and I think they are correct.

Q.—What I think you mean to say now is that the details, the actual site of the roads, had not been laid out until Mr. Davidge came on the scene?

A.—The extent as well as the details.

Q.—The extent was the whole area?

A.—In reclaiming an area, in the way I visualise this reclamation scheme, they would make the land, but it would not at all follow that the Government would decide to complete the full system of roads and surface drains throughout the whole area.

Q.—What do you think they would make it for?

A.—They would do that as and when required.

Q.—You know how contractors work. With regard to your statement at the bottom of page 2, I would like you to tell me if you ever knew a contractor to have conferences with his sub-agents?

A.—Yes.

Q.—You have known of that?

A.—Yes.

Q.—At the middle of page 5 you say, " I mentioned also the necessity for using the run of the quarry to the rubble wall. They would thus have all sizes of stone ". Surely you realise that it is impossible to do anything else. Unless you have enormous storage ground up at the quarry you are bound to clear the quarry. If you are quarrying 2,000 tons a day, if you do not take it away where are you going to put it?

A.—You have to put it on one side if you cannot use it.

Q.—How many months' supply would you put on one side?

A.—In one very large quarry where the output ran up to 60,000 tons a month, none of that small stuff was allowed to go into the work at all.

Q.—It was kept for something else?

A.—No.

Q.—What then?

A.—It was simply put on one side. I quite agree with you it occupied a lot of space.

Q.—Obviously?

A.—And ultimately it was got rid of by selling to other people outside.

Q.—But here you wanted the whole quantity?

A.—But they were putting a lot of this small stuff on one side.

Q.—But they could not put it on one side I have seen the quarry, and it is physically impossible to put a lot on one side?

A.—They were putting it on one side at that time.

Sir Frederick Hopkinson.—They could not; there is no room for it. As the quarry exists to-day there is no room to put a large quantity aside.

Chairman.—Have you been to Khandivli quarry?

A.—Yes. This note was made at that time. The reason for bringing up that point at the time was that they were not sending all that down to the wall.

Sir Frederick Hopkinson.—Then they could not have been quarrying 2,000 tons a day and putting much of it aside. It is absolutely physically impossible?

A.—They were not quarrying anything like 2,000 tons a day.

Q.—That is the rate at which they are supposed to work and have the plant for. At the top of page 7 you say, " The increase of prices between 1912 and 1919 was from 10 to 20 per cent., and between the end of 1919 and 1921 from 50 to 100 per cent." What is that for—labour or material; plant and machinery from England?

A.—It does not include anything from England at all. It is local labour and plant. I do not know whether it was made quite clear this morning, but in my statement I distinctly say that this was an experience which I had in the tropics.

Q.—It does not apply to India; I had forgotten.

A.—But it is very near India, and I thought it was a suitable comparison to make.

Q.—As a matter of fact we were told that the cost of labour had doubled itself in India; that is the evidence. At the top of the page you say: " It is well known to all engineers or contractors who carried out public works during the years following the termination of the war that there was an enormous increase in all prices during 1920 and 1921 ". I suggest to you that that is entirely wrong. The large increase in prices was long before 1921?

A.—Between 1919 and 1921 my experience was that there was a very large increase in prices.

Q.—Over 1912?

O.—No, between 1919 and 1921.

Q.—Is that for machinery from England?

A.—Yes, that is for machinery from England.

Q.—Let me tell you that the absolute highest price for pig iron in September, 1920, was about £11 10s. a ton, and by the end of 1921 it had fallen to below £5 a ton?

A.—At the end of 1921?

Sir Frederick Hopkinson.—Yes.

Chairman.—What do you say to that?

A.—That is coming to the end of 1921. There is a difference between the end and the beginning of 1921.

Sir Frederick Hopkinson.—Take it in March, if you like. The price was then £6 a ton as against £11 10s. a ton in 1920.

Chairman.—What do you say to that?

A.—These figures are taken from my own experience during that time of plant which was arranged for in 1919 and had to be built and supplied up to the beginning of 1921.

Sir Frederick Hopkinson.—Crown bar iron, for instance, in September, 1920, was £30 a ton. By May, 1921, it had fallen to £16 a ton?

A.—It came down in 1921.

Q.—But you say it increased in 1921?

A.—No, to 1921.

Q.—In the early of part of 1920 it rose; the height was reached in September, 1920, and then it rapidly fell?

A.—It came down in 1921, yes. That should be 1922 as a matter of fact. I should have included in there 1919, 1920 to 1921 if I might alter it.

Chairman.—You must apply your mind to the date, Mr. Halcrow. The date on which Sir George Buchanan furnished his estimate of 668 lakhs was February, 1922, by which date there had been a great fall?

A.—I follow that, but by that time—(I am now going into Sir George's province; I would rather not, but I will make just one remark in reply to that)—very large expenditure had been incurred in connection with Bombay. That is the view I take. It had been incurred during the peak of the prices in 1920, which was the peak. That is admitted by all, I think.

Q.—That is quite right.

A.—And his estimate was based on actual cost of the plant during that period.

Sir M. Visvesvaraya.—Which estimate do you mean?

Chairman.—The 668 lakh estimate. He says that Sir George based his prices on the fact that expenditure had been incurred at the peak.

Witness.—Yes, quite right.

Sir Frederick Hopkinson.—But the statement that prices were rising up to 1922 is wrong, because we know that prices dropped away suddenly in 1921?

A.—They dropped away suddenly in 1921 and again in 1922, but that also coincides with my experience. 1920, I consider the critical year, but it began in 1919.

Q.—It began to rise in January, 1919. It went up from £14 to £30 a ton from January, 1919, to about the middle of 1920. Then it fell away equally rapidly until, at the end of 1922, it had gone down to about £10 or £11 a ton?

A.—In the manufacturing of machinery there is a time lag on the basis price.

Q.—We know that prices were falling, because they got a rebate from Messrs. Simons on account of prices having fallen during the time they were actually building the dredgers?

A.—In 1921?

Q.—Yes. At the middle of page 8 you say: "It has been revealed by the evidence taken by the Committee in Bombay that the revised dredging estimates were based on improper data, and are therefore of no value." The revised dredging estimates were based on what the work was actually costing, were they not?

A.—As I understand it, the revised dredging estimates were based on the amount of filling retained in either the first or second season, or both, and therefore I consider that that is improper data on which to base it. For dredging cost it should be based on the work the dredger does, and also one would expect the dredgers to be worked for the full time.

Chairman.—And you would expect that the sea wall and cross-bunds would retain the material pumped?

A.—Yes.

Sir Frederick Hopkinson.—You say it is an improper price, and I am inclined to agree with you. It is only five annas. The dredging price in the project estimate is five annas a cube yard?

A.—That is the project estimate for the dredging, five annas.

Q.—Yes. You say it is based on improper data?

A.—Oh, no.

Q.—That is what you say—" and are therefore of no value."

A.—That is not what I intended to say.

Q.—That is what you do say?

A.—I am referring here to the revised estimate.

Chairman.—That is the document?

A.—No, the revised estimate—not *this* revised estimate.

Q.—You mean the revised estimate of 1,100 lakhs?

A.—Yes.

Sir Frederick Hopkinson.—What is the price there for the dredging? What is the actual price per cube yard in that estimate of 1,100 lakhs?

A.—I do not know what the actual price is in that estimate.

Q.—You say it is of no value?

A.—I am talking about the totals here. In the revised estimate, as I understand the position, if I may put it briefly, they based it on the amount of filling that they had obtained in the first season, and they said: "The dredger has only done so much; therefore it will take 20 or 30 years to complete." I forget the exact figure.

Sir Frederick Hopkinson.—35 years.

Chairman.—Those were Sir George Buchanan's figures?

A.—Well, a very long period. Having started on that assumption of 30 years, or whatever the figure is, to complete, they built up an estimate on that. In my opinion that is not a proper way to make an estimate.

Sir Frederick Hopkinson.—I suppose they were afraid of making estimates. They wanted to go on something they knew, for a change.

Chairman.—They were working entirely on past experience, were they not?

A.—On their past experience.

Q.—They said "If the future is no better than the past, it is going to cost 1,100 lakhs." That is how they did it?

A.—My view is that they should have taken it on the quantity dredged and not on the quantity retained. That is one point.

Sir Frederick Hopkinson.—But did they take it on the quantity retained?

A.—I cannot say.

Sir Frederick Hopkinson.—We have no figures to tell us that. What I should like to know is what price was put in that estimate of 1,100 lakhs—what price per cube yard. Then we can thrash it out.

Sir M. Visvesvaraya.—It comes to 1·1 or 1·2. 360 lakhs is the cost of working the dredger.

Sir Frederick Hopkinson.—I would like to see that figure. I have 250 lakhs here. We can easily work it out.

Sir M. Visvesvaraya.—310 lakhs is the cost of the dredged filling.

Sir Frederick Hopkinson.—I have here the figure of 250·78 lakhs. That looks like about 1s. 6d. per yard.

Sir M. Visvesvaraya.—"Dredged filling, 310-22 lakhs" appears in the 1,000 lakh estimate.

Sir Frederick Hopkinson.—That is ridiculous. They are doing it for a little over half a rupee. (*To the witness.*) You realise that this eight annas spoken of on Page 8 is the cost of working only. It was eight annas three pice I think. That is only the cost of working. That does not include the machinery at all?

A.—No.

Sir M. Visvesvaraya.—This 1·10 rupees also does not include machinery.

Sir Frederick Hopkinson.—It is ridiculous; it is not worth consideration. (*To the witness.*) At the bottom of page 9 you say," "Having perused the weekly statement of progress." Did that include the quantities of dredging done?

A.—Yes.

Q.—We have been told over and over again that those quantities were never known. Did they send you the weekly quantities of dredging done?

A.—Yes.

Sir Frederick Hopkinson.—Can you make anything of that, Mr. Chairman?

Chairman.—Only the fact that this witness says he got it. It did not stimulate Sir George Buchanan, or anybody else, to protest.

Witness.—It was on the basis of those weekly reports that, when it fell to me to take action in the matter, I wrote the letters which have been handed in this afternoon. It was in the middle of the second season.

Sir Frederick Hopkinson.—We have been told over and over again that the quantities of dredging done were never known until the following July or August.

A.—That is true as regards the amount of filling.

Chairman.—Reclaimed material.

Sir Frederick Hopkinson.—No, dredged. I put the question several times, why they had not known every day what the dredger was putting out, and we were told there were no quantities available by anybody?

A.—Yes, the quantities were certainly available from the dredger.

Q.—That is the only important thing. The amount of land reclaimed has nothing whatever to do with the dredger.

A.—If I may refer for a moment to the letters which have been handed in to-day, we cite in *this* letter those weekly reports. We refer to the week ending 18 December, 1924, the 1st January, 1925, the 29th January, 1925, and the 6th February, 1925—the average hourly output per week. We have here 1222, 1133, 799 and 613. These have been taken out for the purposes of the letter. But there was no information as regards the amount measured as reclaimed land until the following summer; that is quite correct.

Chairman.—Sir Frederick is on soundings.

Sir Frederick Hopkinson.—I am on soundings—the only proper way to measure up the work done.

A.—They were taken.

Sir Frederick Hopkinson.—We have been told that the soundings were taken daily, handed into the office, and nothing done with them.

Chairman.—And sent to London week by week?

A.—Week by week.

Sir Frederick Hopkinson.—That they actually took out the quantities there and sent them to London?

A.—That was the basis of taking this matter up here.

Q.—How can you test a dredger's working unless you take soundings? It is the only proper way to do it, is it not?

A.—That, in addition to taking the tests in the pipes.

Q.—That is for casual reference, if you want to know at 10 o'clock in the morning what percentage you are getting; but at the end of the week you would not be satisfied with that, would you?

A.—No; you want block measurements. Measurements in the pipe, in my opinion, should be taken frequently as a guide.

Q.—They are a comparative guide, but you would not accept them as final? You would not pay on them? You do not accept them as final? You would not pay on them as Resident Engineer, would you?

A.—Certainly not. We would pay on the actual sectional measurement.

Q.—Did you realise that when you were complaining about their taking the hard clay to the moorum that they had to get all that it was possible for them to get owing to the restrictions put on by the Indian Marine and the Port Authorities, and that there was no spare material available?

A.—That is not as I have understood the position.

Q.—There are 36 millions. If you deduct from that 15 million that leaves only 21 million yards available. Is not that so?

A.—21 million from the harbour. When I became connected with the work (this is outside my province altogether) they had decided to obtain material from Back Bay.

Q.—They were talking of it?

A.—They had made up their minds, I think, then. I am speaking from memory. The Resident Engineer, when he had completed his borings, wrote that there were over 25 millions yards of material available in Back Bay. I think I am right?

Q.—Yes. You are quite right. Twenty-five million was the quantity given.

A.—Therefore, between the two sections there did not seem to me to be any necessity for scraping up that last cubic yard of rock from the bottom.

Q.—It is all a question of time. On page 13 you give some general remarks about how machinery should be bought, and you say: "The plant is tested against the specification before being taken over from the builder." That is all a question of arrangement, is it not, and what you put in the contract? If you put in the contract that it is to be tested in Bombay on the actual work it has to do, that is the proper place to do it, as was done in the case of the "Kalu" and "Jinga"?

A.—That is all a matter of arrangement, as I understand it, but, as I mentioned here, I have not come across a case of that kind in my experience.

Sir Frederick Hopkinson.—You are the first man I have come across in connection with this enquiry who has entirely agreed with the view I put forward, that you cannot move clay without increasing its bulk. I put that as a proposition to them in Bombay, and it seemed to surprise them all. I notice you agree with me?

Chairman.—It is a fact, is it not?

A.—It is a fact, that is to say, briefly, that the quantity of filling required in the reclaimed area will be less—No, let me put it the other way.

Q.—That you cannot move solid material without increasing its bulk?

A.—Yes.

Chairman.—Material which has been under compression for centuries, when dredged out, increases in bulk.

A.—Which means that the quantity of material to be dredged is less than the quantity of filling required.

Chairman.—If you are dealing with clay, and clay alone?

Sir Frederick Hopkinson.—In the last paragraph, on page 15, you say: "In order to help the Department we looked into the question of the best way to put the "Kalu" to work in Back Bay. I suggested that the "Kalu" should cut a flotation channel, pumping the material through a short pipe-line, say, 100 yards, to one side." Is this the plan that you sent out giving those views? (indicating same to the witness).

A.—I do not know that a plan was ever sent out. My connection with it was when I discussed it with Mr. Brims.

Q.—What is the stamp on it?

A.—That is the office stamp, 2nd May, 1923. That would be about the time.

Q.—Was that your idea at the time?

A.—This was my idea, subject to the information which at that time was being asked for regarding the cables coming across *here*, which would necessitate moving the channel to this point *here*, when the position of the Eastern Telegraph Company's cables had been determined. My idea was that rather than go in and dig a hole, a channel should be dug in so that the vessel should be free to come out, and, always being afloat, that she would dredge all the time.

Q.—*This* is the plan which illustrates the instruction or the idea?

A.—The idea.

Q.—This channel is 3,200 feet long and 300 feet wide?

A.—My intention was not take it as wide as that. That is diagramatic only.

Q.—What width did you intend to take it?

A.—Perhaps 50 yards.

Q.—What about the depth? *This* would be for the "Kalu" to float in at low water?

A.—Yes.

Q.—Do you know anything about the soundings on *this*?

A.—*That* is the 2-fathom line, and *that* is the 1-fathom line.

Sir Frederick Hopkinson.—So that the depth of water *here* would be about 3 feet, I suppose—about half a fathom? You would want to float the "Kalu" in about 3 fathoms. Twelve feet would not float the "Kalu." Did not she draw about 14 feet?

Chairman.—No, her mean draught was 8 feet.

Witness.—I cannot say from memory, but my recollection is that the two fathoms suggested here left comfortable margin.

Chairman.—"Mean draught, with 150 tons coal in bunkers and 820 tons water in tanks, about 8 feet."

Sir Frederick Hopkinson.—In the middle of page 17 you say: "The Government of Bombay placed the execution of the works in the hands of the Development Directorate, who took the same position as contractors and rightly assumed full control." Why do you say that? All the time we were in Bombay the Development Directorate absolutely refused to take that position, and said that they never had taken that position.

A.—I have never understood any other position but that they were carrying out the work. They were the executive. That has always been perfectly clear in my mind since I became connected with the work.

Sir Frederick Hopkinson.—Why did not you settle the matter with Sir Lawless Hepper. You were out there? He said most positively that he never occupied that position; he never interfered in the carrying out of the work, except on one occasion, and that was the occasion of sealing the sea wall. That is the only occasion on which he said he ever interfered with the carrying out of the work. Is not that so, Mr. Chairman?

Chairman.—Yes.

Witness.—I have always always looked upon Sir Lawless Hepper as the manager in charge of the work. I might just mention one or two points which have been brought

to my notice. I think they were before my time. They sent home a requisition for additional plant, and the firm had to express the opinion that they thought the plant (wagons, cranes, or whatever it was) was rather excessive for the quantities with which they were working, and they wrote back to that effect. They received instructions from the Director of Development to order the plant.

Sir Frederick Hopkinson.—My recollection of that is that Sir George Buchanan wrote saying that he did not like to interfere with the liberty of the man on the spot. Is not that so?

Chairman.—But that at the same time, all expenditure did increase the capital cost of the work. The letter of request for the plant was the 17th March, and Sir George Buchanan wrote a very excellent reply suggesting to them that some considerable portion of this plant was not necessary, and he asked Mr. Lewis to communicate with the Development Director and cable his opinion. The Director of Development cabled his opinion that the plant was necessary with the exception of one crane; and that plant was ordered, but it was ordered unquestionably in the belief of Sir George Buchanan that the whole of it was not necessary and was an extravagance.

Witness.—That is one instance which proved to me that the Directorate assumed full control as regards the execution of the work.

Sir Frederick Hopkinson.—Were there any other instances?

A.—I have no doubt I could find one or two more.

Chairman.—We asked Sir George whether he would tell us of any other instances in which he put the brake on. He was putting the brake on there, and saying " Look here, you are ordering plant which I think is excessive, and although a great deal must be left to the man on the spot, nevertheless this is going to cost a great deal of money." That was an instance of his putting the brake on. We have asked him to give us any other instances, and no doubt he will, if they occurred. At the moment I do not know of any other except that. It was greatly to Sir George Buchanan's credit to do that. It was quite proper and quite right.

Sir Frederick Hopkinson.—But is it not most extraordinary that, in a matter of this major importance, nobody seems to have thought to have had the matter settled as to who was really controlling this work? You thought Sir Lawless Hepper was doing it. Sir Lawless Hepper says positively that he never intended to do it and that he never did do it.

A.—As far as I am concerned in giving evidence here, I never knew, until I read some of the evidence taken in Bombay, that Sir Lawless Hepper did not consider himself in complete charge of the work.

Chairman.—Sir Lawless Hepper preserved an air of the greatest detachment. He disclaimed all association with the slightest technical knowledge: he was merely the administrative head.

Sir Frederick Hopkinson.—He said himself that he was not competent to do it.

A.—Then why was the work put in his hands?

Q.—He says it was not?

A.—But surely he was the Director of Development, and they were carrying out the work? He had full control of all the accounts, and everything?

Q.—Accounts?

A.—When I say accounts, I mean the purchase of materials and plant, and everything else. His word was law. If Sir Lawless Hepper had said to his staff, " These dredgers must work 24 hours a day," they would have worked 24 hours a day.

Q.—I am not so sure about that, but I think Sir Lawless Hepper was afraid of encroaching upon the privilege of Sir George Buchanan.

A.—It was very unfortunate that he did not say so a long time before.

Chairman.—I think the real position was that Sir Lawless Hepper left it to Sir George Buchanan, and Sir George Buchanan left it to Sir Lawless Hepper, and therefore, relatively, nothing was done.

Sir M. Visvesvaraya.—But what becomes of your responsibility according to the terms of the contract? It is said in the first clause " They shall perform all work and duties devolving upon engineers of large works." " All work and duties." You did not disclaim that responsibility for all that time, and now, when trouble comes, you say, " We had nothing at all to do with it " etc.?

A.—No; I would not like to think that.

Chairman.—First of all you would say that this agreement was entered into nearly a couple of years before you joined the firm?

A.—Yes. I have nothing whatever to do with that agreement. It was entered into long before my time.

Q.—It is " all work and duties devolving upon engineers of large works "?

A.—I would like to say something about that, because I am the engineer for various works, and large works, at the present time. I am now talking about my position as engineer—not consulting engineer, which is another position I occupy with regard to certain other clients.

Q.—Nor contractor?

A.—And I am not a contractor. I am glad to say I have been a contractor for a number of years, and I value that experience very highly indeed, but I am not now; I am back again where I started on the consulting engineer staff. As consulting engineer I have tried to explain briefly in my statement what my duties are. Work is actually being carried out at the present time in Europe, in connection with which I act as the consulting engineer. I do not go near those works unless I am invited to do so by the Board of Directors. They have their own staff out there; they have their own machinery, and they carry out the work. They ask my advice when they want it. In other cases I am the engineer responsible for carrying out the works. In those cases I have prepared the plans, or the designs, the specifications and the schedules of quantities. Those works have been let by contract and are being carried out by contractors. I have my own staff of resident engineers and assistants on the work who look after things for me locally, and I visit the works periodically. I have no executive control over those works. The contractors are responsible for the speed of the work, and they are under penalty if they take longer than the contract time.

Q.—The contractor has bound himself to produce a given result for a given price within a given time?

A.—Yes. If he does not make the requisite progress and I am not satisfied, what can I do? I have three courses open to me. First, I complain. If it is not put right and still goes wrong it is then open to me to refuse interim payments on certificates. If that does not bring the requisite progress, and things are still going badly, under my conditions of contract I can determine the contract and take it out of his hands altogether. That is a very serious matter. That is the position of the engineer responsible for the work, but he has no control over the payment of the men or anything else. All those are matters for the contractor to deal with.

Sir M. Visvesaraya.—That again, is due to Sir George Buchanan's position, because Sir George Buchanan has no staff out there.

A.—May I just go on to the analogy in Back Bay?

Chairman.—Please do.

A.—In Back Bay the work is being carried out without a signed contract, as it were, between the Government and itself, because the client, the Government, is carrying out its own work. Therefore the engineer unfortunately does not have the same control. In this case it was apparently arranged that the chief engineer responsible under the Director of Development for the execution of the Back Bay works should act as resident engineer, and the firm should have his nomination. I did not like the arrangement, but there it was. Let us take it as it stood. His duties as resident engineer would be to report to Sir George Buchanan or to the firm, as the case may be, on all matters concerning permanent work. If there were any work still remaining to be designed, which is quite an ordinary feature of large works, he would send him the local data on which the firm could build up their designs and further specifications. But in all matters relating to execution he was responsible to the Director of Development. I have indicated in my statement that I once occupied a somewhat similar position. That was 16 or 17 years ago—and a small work; I was sent abroad by Mr. Meik as resident engineer on the reconstruction of a pier in Europe. It was intended that the work should be carried out by contract. It was in the early days of reinforced concrete, and the design included the handling of what were then very large piles running to about 60 feet in length. Tenders were invited from contractors locally, but they were unsatisfactory. They were rather afraid of the work—it was beyond them—and I received instructions to carry out the work myself for Mr. Meik's clients, and I did so. In all matters relating to the designs or to Mr. Meik's specification, to the tests of materials and workmanship, if there were any little alteration which local conditions required, I referred those matters and reported progress, to Mr. Meik, any questions as to what labour was to be paid, where I was to obtain my materials and buy them, and so on, I dealt with his clients out there. That is a somewhat similar position, although I say it was a small job and not of the magnitude of Back Bay. That is as I understand the position.

Sir Frederick Hopkinson.—But circumstances are not quite the same in that case and in Bombay. Take the dredging, for instance, which is the major part of the scheme in Bombay. There is no designing there, having once bought your dredger?

A.—The actual designing required for the Back Bay work is very small.

Q.—Is there any in the dredging work in Bombay?

A.—No actual designing.

Q.—Is there any engineering in it beyond buying the dredger—there are no plans to make?

A.—There are no plans to make

Q.—There is nothing to supervise. All you have to do is to get your output?

A.—All you have to do is to get your output.

Q.—There is no engineering about it at all.

A.—It is in the wall that there is engineering.

Q.—Leave the wall out. I am speaking of the dredging. There is nothing for an engineer to do in connection with that?

A.—No. Actual practical engineering matters crop up in connection with these engineering schemes. In one which I was connected with it transpired that quite a lot had to be done in connection with engineering. The material was so fine in suspension that a great deal of it was carried away in the overflow. Instead of the surface water running clean away from the reclaimed area it was carrying quite a lot of pumped material in suspension, the material was fine silt and mud. It eventually required the dividing up of the reclaimed area into a very large number of small compartments for pumping and repumping, and changing from one to the other.

Q.—That had been done here. It was separated into compartments by cross-bunds. There is no engineering, is there. Why should an engineer be paid 2 per cent. on the cost of dredging here, because he had absolutely nothing to do for it?

A.—If one starts to subdivide up what an engineer should be paid for on a scheme, and what he should not be paid for, it would be rather a difficult matter, I think.

Q.—I am suggesting that as there is no engineering, that 2 per cent. covers the control of the work. But that is a matter of the construction of the document.

A.—I would disagree with that.

Sir M. Visvesvaraya.—There is one point you have not answered. You had no representative on the spot. You yourself are 5,000 miles away from the works. Why did you not make arrengements to see that your share of responsibility according to the contract was properly fulfilled? You have not done so.

A.—We are going back now and I do not want to step out of my province; but briefly, I say that the resident engineer was the firm's representative. Later on, I think early in 1923, that question was discussed by Sir George Buchanan with the Government of having a separate representative, and it was not agreed to.

Q.—If it was not agreed to, then you ought to have given notice according to the contract, and said: " Something has got to be done. Some proper arrangements will have to be organised ".

A.—I must leave that to Sir George, because it is really outside my province.

Q.—You are arguing by analogy.

A.—I was trying to explain to those members of the Committee who are not in the same profession, who are not dealing with work as we are in Westminister, what the relative position of engineer, consulting engineer and contractor is.

Q.—I want to apply your principles to this case, but you do not want to go into that, I understand?

A.—I have tried to do it.

Sir Frederick Hopkinson.—On page 20 you say: " The dredger ' Sir George Lloyd,' if properly handled, can give her designed output in the material in the harbour." You make that as a statement.

A.—I take it from the evidence given in Bombay.

Q.—" The Development Department staff have admitted this to the Committee."

A.—I am looking for that reference which was mentioned this morning to send it on to you. I am going to let you have that reference.

Q.—I thought you were making that first statement on your own authority?

A.—No.

Q.—On page 21 you take as the basis of your cost 5 annas per cubic yard. You are unable to point out to me any work that has ever been done at anything like that price?

A.—You are talking about suction dredgers, are you not?

Q.—Yes.

A.—Not about bucket dredgers?

Q.—Suction dredgers?

A.—I have taken those figures from the evidence.

Q.—But we have no evidence that it can be done at that price—none at all, but quite the contrary.

A.—You can take that paragraph as I put it there " on the basis of 5 annas per cubic yard." That is taking the assumption, to begin with, that it would require 6·06.

Q.—It is only an assumption.

A.—We go on from that in the same paragraph to refer back again to some figures on a previous page, where we take 8 annas, which they gave in evidence, as the cost of operating the dredging plant.

Q.—If you take a different assumption, it might cost as much, or only one-fifth as much, and, therefore, it does not help you at all?

A.—No; these figures are taken from the evidence.

Q.—We have no evidence of a price of four annas for pumping.

A.—8 annas.

Q.—This says: "On the basis of 5 annas."

A.—I think the paragraph is clear as it stands, taken as a whole, is not it?

Q.—If you say it is an assumption, it is clear.

A.—Yes.

Q.—But an assumption does not help us. A little further down the page you say: "When investigating the scheme, I found there was no intention of covering the whole area with moorum 1 foot deep." Where did you get that from?

A.—I got that in my conversation with Sir George Buchanan.

Q.—But there has been an intention right away from 1919 to cover it, first of all 1 foot deep and subsequently 2 feet deep. The quantities have been given as 1,810,000 yards and 3,620,000 yards.

A.—Quite so. That is the basis on which quantities have been taken out. I asked the question: "Is it intended to put a carpet of moorum so to speak."

Q.—When you were out there?

A.—Yes.

Q.—There was nothing to put it on there then?

A.—I wanted to know what the intention was with regard to the moorum: was it intended to put a carpet over the whole area; and I was told "No."

Q.—By whom?

A.—By Sir George.

Q.—Out there?

A.—Yes.

Q.—But he has provided for it?

A.—That was taken as the quantity of moorum which would be required to make up the roads and other areas, because where the clay was taken from the Harbour it would be good ground on which you could walk straight away. Where the mud was it would have to dry out on the surface, and then receive moorum on the top. That is what I meant by that.

Q.—But this quantity has been taken over the whole area?

A.—As an average.

Q.—The only alteration made to it has been to double it—to increase it to 2 feet?

A.—When was that increase to 2 feet made?

Q.—I cannot put my finger on it, but I have the figures here. One of the estimates was 3,620,000 cubic yards.

A.—I do not know that figure.

Mr. Billimoria.—You have in your note in several paragraphs expressed your personal opinions?

A.—Yes.

Q.—If you do not mind, might we have briefly what your qualifications are as an engineer?

A.—I have had between 25 and 30 years' experience as an engineer.

Q.—Have you qualifications by examination or practical experience, or membership of any institution?

A.—Yes: I am a Member of the Institution of Civil Engineers, a Member of Water Engineers, a Fellow of the Royal Meteorological Society, and I have a great deal of practical experience all over the world, both at home and abroad.

Q.—You will agree with me that membership of the Institute of Civil Engineers is considered a great honour and privilege by members of your profession? Is not that so?

A.—I am quite pleased to be a Member of the Institution of Civil Engineers.

Q.—How long have you been in this profession of Civil Engineer?

A.—About 27 or 28 years.

Q.—It is recognised all over the world as a special qualification to be a member of the Institution of Civil Engineers?

A.—All Civil Engineers are not Members of the Institution of Civil Engineers.

Q.—But those that are would put it forward as one of the qualifications to secure work, or to secure a job? It is considered a qualification?

A.—It is in some cases, not in all.

Q.—Had you had any personal experience of the local conditions in Bombay before you went out to Bombay in connection with this reclamation work?

A.—Not in India.

Q.—Have you any intimate or personal knowledge of the Back Bay reclamation, beyond your visit to Bombay which you have referred to?

A —That was my only visit to Bombay.

Q.—If you will kindly turn to page 2 of your note, you say in the first paragraph: "Also, in the case of staff or other employees which the Department required from this country, the firm assisted the High Commissioner in the selection of suitable men." You were, therefore, satisfied as to the men who were employed by the High Commissioner being perfectly suitable for the job they were employed on?

A.—Yes.

Q.—May I trouble you to turn back to page 1, where you say: "When orders were placed by the India Stores Department the firm carried out the necessary inspections and tests and reported progress to the Development Department"?

A.—Yes.

Q.—You were the engineers responsible, and had to advise the Government and the Stores Department with regard to the suitability of the plant, and you inspected and tested the plant?

A.—When the Development Directorate sent home requisitions for a crane, they specified they wanted perhaps a 5-ton crane, or whatever it was; and we then had to invite tenders and specify generally what was required. The tenders were inspected and one recommended and forwarded to the India Stores Department; and then after that we had to see that the crane was properly built and inspected, and advise the Development Directorate.

Q.—The High Commissioner, therefore, evidently relied on your advice on such matters?

A.—As regards the purchase of plant.

Q.—You must have very carefully studied Sir George Buchanan's report, being intimately connected with his firm as one of the members thereof.

A.—I have read the report.

Q.—I suppose before you came here to give evidence you again had an opportunity of going over it very carefully?

A.—I have not gone over the report very carefully before coming here. I think I have explained my position with regard to the work as briefly as possible in my statement.

Q.—Even being connected with the firm on a project of such magnitude, you must naturally have taken some interest in it?

A.—Undoubtedly, I have taken an interest in it.

Q.—You have used this document, the report which has given birth to this scheme?

A.—I have read this report.

Q.—Before I go on to the details of the report, will you agree with me that the prices of commodities all the world over before the war were normal—what we call normal prices—and during the war and thereafter the prices had advanced substantially all round?

A.—Prices advanced in a greater or less degree in different countries. That is my experience.

Q.—I want to take India and England; let us confine ourselves to these two countries.

A.—I cannot give you details for India.

Q.—You have no personal experience of Indian conditions at all?

A.—No.

Q.—Taking the prices in this country of both labour and materials, it is well known that during the war and thereafter they advanced until they reached the peak in 1920?

A. -Yes.

Q.—If that was the position, taking a figure in 1913 for an article that would cost, say, £100, what would be the approximate cost in the year 1919 or 1920?

A.—In England, you mean?

Q.—Yes.

A.—In the year 1919, as I think I have already said, perhaps two to two-and-a-half times.

Q. Therefore supposing an engineer had submitted an estimate in the year 1913 at a certain figure, you would, if you were called upon to submit an estimate in 1919, make your estimate two-and-a-half times the original figure?

A.—No, not necessarily.

Q.—How would you qualify your answer?

A.—If the estimate had been made by myself, I might be prepared to say yes.

Q.—That is what I want.

A.—Not if the estimate were prepared by another person.

Q.—I am not asking for any other person; I am asking you as an engineer of 25 years' standing and repute as you have stated, would you have put down the figure in the estimate of 1919 at two-and-a-half times the original figure?

A.—My own estimate?

Q.—Yes.

A.—If it were based on a previous estimate of my own?

Q.—Yes.

A.—That, of course, is important.

Q.—You are comparing your own figures of 1913 with 1919?

A.—That is what I mean.

Chairman.—Mr. Halcrow says: "If in 1912 I have given an estimate for so much, then in 1919 I would have multiplied it by two or two and a-half times, but if somebody else in 1912 had given an estimate, I am not prepared to say I should multiply that by two or two and a-half times."

Mr. Billimoria.—Very well.

A.—Just to give you an instance of the variation that one meets with in preparing estimates for civil engineering works, I do not think I exaggerate when I say that in all the tenders which I received for works during the last three or four years, the difference between the lowest tender and the highest tender prepared by experienced contractors has varied up to 100 per cent. Therefore contractors differ in their estimate of works by perhaps 100 per cent.

Chairman.—Some are in a hurry to get rich.

A.—I thought that might help you.

Mr. Billimoria.—I am quite prepared to accept your answer so far as it goes, but what I am suggesting is this: Suppose an engineer of very great repute had prepared an estimate whose figures had been considered to be thoroughly reliable, whose estimate had undergone scrutiny and examination from another independent expert, if those figures had been submitted to you thereafter, having regard to the circumstance that prices had advanced beween 1913 and 1919, would you not have proportionately increased your figures in the estimate which you submitted in 1919?

A.—No. I would accept no figures of any other estimate until I examined them in detail myself.

Sir Frederick Hopkinson.—Hear, hear.

Mr. Billimoria.—In order to examine the figures in detail, how long would it take you to inspect the estimate on a project of such a magnitude as this?

A.—I do not know whether it has been brought before the Committee at all, but the preparation of estimates by engineers or by contractors is an entirely different matter; there is a very big difference. I can speak with some authority because, as I have already explained, I have been on both sides of the house.

Chairman.—It has been explained to us quite clearly.

A.—On the point of taking the estimate on schedule prices, I should be prepared to criticise it on the information given here, because they give the schedule rates annas 5, 6 or 8, and so on, whatever it may be for the cubic yard; but in a contractor's estimate it is quite different. If it has been explained, I need not do it.

Sir Frederick Hopkinson.—You could not criticise it unless you knew a great deal more about it.

Chairman.—As a contractor you could not give a price for a work on the information contained in that report only?

A.—To base a tender on this—no, I do not think so. One would base it on the contract drawings specification and schedule, on which to prepare a tender.

Sir Frederick Hopkinson.—And, moreover, the conditions of the site?

A.—An examination of the conditions of the site to prepare the tender is wise, though one has heard of cases where contractors take on large works without having seen the place at all.

Q.—They are not wise contractors?

A.—I would agree with you there; but that is not an unknown case.

Mr. Billimoria.—Your answers are not answers to my question at all. What I want to get from you is this: If you were not relying on somebody else's estimate, and you were called upon to submit an estimate on a work of such vast magnitude as this, where you say you would not do it without a thorough investigation on your own account, how long would it take you to do it? That is my question to you.

A.—To make a report and estimate on a work of the magnitude of Back Bay I should personally like something in the region of six months, if I could get it. That is speaking for myself.

Chairman.—Six months' personal investigation on the site and going all over the place?

A.—Not necessarily stopping there for six months.

Q.—But collecting information in great detail from there?

A.—Collecting information might only take a few weeks. I can give you an instance where my services were borrowed by a firm of contractors to go abroad and report to them on all the local conditions, and I was in that country, I think, for five or six weeks. On my report they based a firm tender running into millions of sterling before the war on pre-war prices. That was considered by the contractors sufficient time for me to remain there and make my report.

Sir Frederick Hopkinson.—That is on the assumption, and is bound to be on the assumption, that they had confidence in you.

A.—Well, I must assume that from the fact that they specially asked me to go from my firm and go out and do that work. That was a period of five to six weeks in the country. Of course I worked very hard, and I got all the information, and then I wrote my report.

Mr. Billimoria.—If you had done it in a lesser period, that report would be simply perfunctory or superficial?

A.—No; I think it depends a good deal on who is doing it. One engineer might do it very quickly and grasp the facts quickly—he might be very quick at grasping the principal points and assembling his facts; whereas another engineer might take very much longer. I do not think one could definitely state the time to be allowed for making that report.

Q.—How long would the most brilliant head in your profession take? You say there is an engineer and an engineer, and I quite admit that. But how long would the most brilliant head take?

A.—I am afraid that would be pure guessing on my part.

Q.—You have given us a period as six months with your vast experience of 25 years.

A.—I have given you a definite case which I thought perhaps might help you, of a much larger work than the Bombay Back Bay reclamation scheme. I am talking about 17 years ago, 1909. The figure there was something like £4,500,000, which represented work of a magnitude of about £9,000,000 to-day. For the contractors to put in their firm tender on that I was some five or six weeks in the country concerned. Is that a guide to you of what I mean? That is what I myself would do.

Q.—If you were called upon as an expert engineer with your vast experience, having done work of such magnitude, to report upon a report of another skilled engineer, how long would you take to do it and to criticise his report, go into details, and thoroughly investigate it for the purpose of advising your employer?

A.—May I take a recent case again? I have recently reported on a scheme got out by another engineer on the Continent of a magnitude of about £2,000,000 sterling. All the plans, all the papers and all the documents were put before me. I think that from the time they reached my office to the time that I sent out my report—and during that period I was engaged on many other works at the same time—it would be about five weeks.

Q.—During those five weeks would you exhaustively go through all the matters? Would you test the figures, or would you superficially glance through them and accept them as correct?

A.—The information placed before me was very full; it was not all that I wanted, and I had to delay once or twice to obtain further information. Having got that, I had all that I required.

Q.—Assuming that you were in the position of an independent expert advising your employer, no matter what materials are placed before you, would you rely on those materials?

A.—I understand your question to be that if a report and facts and plans were placed before me, how long would I take to go through them?

Q.—As an independent expert advising your employer?

A.—As an independent engineer reporting on them—I tried to give you a recent instance.

Q.—You said you would take about five to six weeks?

A.—That is what I took on this occasion.

Sir Frederick Hopkinson.—Did that include a visit to the site?

A.—That did not include a visit to the site.

Mr. Billimoria.—If you were not to accept the various plans, estimates and figures therein, and thought it would be necessary to modify them in a certain measure, and not accept everything in the data, how long would it take?

A.—Well!

Q.—An attempt has been made to say that on certain matters the report has been accepted, and on other matters the report has not been accepted. I want to make myself perfectly clear to you. I do not want to keep back any cards; I am placing all the cards on the table.

A.—I am not suggesting that. I simply say it depends so much on the individual. I have tried to give one or two cases of my own experience. I do not know that I can say very much more to that.

Chairman.—It is rather like Counsel's opinion in a very voluminous case. Some Counsel might work the greater part of each day for six or seven weeks, and then give an opinion. A Counsel with a quicker brain and able to retain the facts might give an opinion in three weeks. There may be some Counsel who would never be able to give any opinion of any value at all in six months.

Mr. Billimoria.—I quite appreciate your point. But where the report has to be digested, and a part of that report has to be accepted as correct, and the other part is to be challenged, would not it make a difference in arriving at the conclusions in the sense that it would require some greater length of time? If I was reading this document and I accepted it as correct I could express an opinion, as you say, within a certain specified time. But if I agree with two pages of the report and disagree with the remaining portion of it, in order to arrive at my conclusions and make definite recommendations it must necessarily take some time, because it would mean a matter of working out the details, would not it?

A.—On the question of time, at the risk of repeating myself, I am afraid I must again say that it depends almost entirely on the individual and his individual experience.

Sir Frederick Hopkinson.—There is another point which cropped up a day or two ago. That report included an estimate. There are two kinds of estimate, as Mr. Halcrow knows quite well. One is that which is made by a contractor under which he is compelled to carry out the work; and the other is made by an engineer under which he can get supplementary estimates. They are totally different things, are not they?

A.—Yes; they are totally different things, because an engineer as you so well know, if I may say so, always handles schedule rates.

Q.—He always knows that a supplementary estimate can be obtained. I am pointing out that is the difference between his estimate and that of a contractor.

A.—But apart from the question of supplementary estimates, we have known cases of contractors getting extras on their contract.

Q.—No; not if they are finally able to carry them out—I do not agree with you at all.

A.—I am able to speak of the handling of schedule rates from experience. If an engineer goes to a new country one of the first things he does is to make enquiries as to the cost of work locally. He does not ascertain, first of all, the price of labour and how many yards of excavation a man can do per hour. He deals with the finished schedule rates which include everything; but a contractor who has to put in a firm contract——

Q.—A clinching document?

A.—Yes—he starts off, if I may suggest it, with the postage stamps he is going to pay for in his office.

Q.—Precisely.

A.—Tenders for works which I have been engaged on may run to 150 pages of foolscap, taking the details right the way through. Whether the results which he obtains at the end is of greater value than the engineering estimate, is another matter.

Q.—Do you say it is another matter?

A.—Because the contractors vary so much in their tenders, as I have already said this afternoon. The tenders vary very much from the lowest to the highest.

Mr. Billimoria.—In answer to Sir M. Visvesvaraya's question you said while you were in Bombay a specimen of clay was exhibited to you?

A.—Yes.

Q.—You found that material was quite suitable, did not you, when you examined it?

A.—Yes.

Q.—It was suitable material?

A.—Yes.

Q.—When did you first know that the material was unsuitable?

A.—I do not know that I know that now.

Chairman.—He was away before the dredging commenced.

Mr. Billimoria.—But he takes a sample of clay that was shown to him from the bed of the sea.

Chairman.—Quite so.

Mr. Billimoria.—You thought that material suitable?

A.—I considered it suitable.

Q.—When did you know that the material that was dredged from the harbour was unsuitable.

A.—I do not know that I know it now.

Q.—You do not know it now?

A.—No.

Sir M. Visvesvaraya.—Mr. Settle knew, because he has stated it in his statement.

A.—That comes in Mr. Settle's evidence. He has seen the pumping taking place. I have not seen it.

Chairman.—Anyhow, you say you do not know.

Mr. Billimoria.—So that the various conclusions you have arrived at in your report are based upon something that you have heard, and of which you do not personally know?

A.—I saw a sample of the mud, as I say, and I have also had experience of reclamation which was carried out by pumping mud and silt on shore; and that reclamation was successful.

Q.—Which reclamation are you referring to?

A.—The one I was connected with in the Straits Settlements.

Q.—Here, when you are arriving at certain calculations and expressing a definite opinion, you do so on certain information, not on your own personal experience and knowledge?

A.—I have said that I have seen a sample of it—a small sample, it is true.

Q.—I am not asking you about the clay, but generally. If you do not know anything about the unsuitability of the clay, it necessarily follows that all the various opinions that you have expressed in this document before us now are based upon hearsay information, and not on your own personal knowledge?

A.—You mean it is not based upon seeing the material in the reclamation? I have not seen that. I have not been in Bombay since the pumping commenced.

Q.—You have not been very closely associated with the progress of the work?

A.—No. This Back Bay scheme is essentially Sir George Buchanan's scheme. In a firm like ours each partner has his own work and his own clients to deal with.

Q.—That is right.

A.—In this case I have discussed matters with Sir George Buchanan frequently. The only occasion on which I had to step in and take action was in the spring of 1925, and I have tried to show what I did in the matter of speeding up the dredging.

Q.—If you were not specially connected with the scheme, but were occasionally consulted on certain matters, what prompted you to come before this Committee with this document and give evidence to-day? What is the reason of your presence here to-day?

A.—I was invited to come. I was asked if I would give evidence, or give any information as to what I knew about the work.

Q.—By whom?

A.—By Sir George Buchanan.

Chairman.—About the visit to Bombay?

A.—About the visit to Bombay.

Mr. Billimoria.—You have gone far beyond your visit to Bombay. You have not confined yourself to Bombay. You have expressed an opinion on things on which you have no personal knowledge.

A.—Can you give me a case?

Q.—Everywhere you have expressed opinions, and now you say that you know nothing about it.

A.—No; I think not. Can you give me a case where I am expressing an opinion?

Q.—In the course of your evidence to-day you have stated several matters of opinion which you arrive at which are based upon information, and on which you had no personal knowledge of the things.

A.—It depends upon exactly what you mean by " personal knowledge." If personal knowledge is to be confined to being in Bombay, that is limiting the expression very much. One may have personal knowledge by being in close touch with the people who are engaged on the work, and seeing the papers about it.

Q.—What I want to find out is, if you were confining yourself merely to your visit to Bombay, I can appreciate the trouble you have taken in coming before the Committee; but if you are going beyond that and expressing certain views, I want to know where you get that information from, as it is not from personal knowledge.

A.—It is my personal knowledge in this way, that I have had frequent conversations with Sir George Buchanan.

Q.—That is, I think, hearsay. That is one thing. I hear from my clerk something, and I base my conclusions on that. That is what it comes to?

A.—No; I do not think I could agree with that.

Q.—Very well. We will leave it at that. In the course of your conversations and your perusal of documents you may have known that the whole of the reclamation was anticipated to be completed by the end of 1926?

A.—That, I think, was the original report which has been revised to 1930-31 by the Development Department.

Q.—If your recommendations are followed perhaps we may not see the end of it till 1954; but that is not our concern. You anticipated that the whole of the reclamation was to be completed by the end of 1926 originally?

A.—That is in Sir George Buchanan's report. It was all before my time.

Q.—Although we are at the end of the year 1926, you know also from hearsay knowledge, which is not your personal knowledge, that not even 25 per cent. of the work has been completed?

A.—Of the dredging?

Chairman.—It is as 4 is to 25.

A.—Yes; it is about 16 per cent.—I have that figure in my statement—as against the estimate here of 30 per cent.

Mr. Billimoria.—On page 18 of your note you say Sir George Buchanan remained in Bombay for a longer period than was necessary in your opinion, and certainly much longer than you have ever known an engineer for large works to stay. On what authority do you make that particular statement?

A.—My experience.

Q.—Do you know what the contract between Sir George Buchanan and the Secretary of State was?

A.—I have read it.

Q.—The words used therein are " several months." Would you call a couple of months " several months "?

A.—I have not got a copy of it before me, but I do not think it says that.

Mr. Billimoria.—It says so in Sir George Buchanan's own note of his interview with Mr. Montague.

Chairman.—But not in the contract.

Mr. Billimoria.—The basis of the contract was the informal interview with Mr. Montagu, Secretary of State for India.

A.—I have no knowledge of those interviews.

Chairman.—The contract said for such period during the working season as he or the Government of Bombay should think necessary.

A.—Those are the words I remember.

Sir M. Visvesvaraya.—That is generally; but in the understanding with the Governor it was put as much longer. " Several months " are stated in his own statement.

A.—But not embodied in the contract.

Mr. Billimoria.—" Undertook to spend a few months every year in Bombay."

A.—But that does not appear in the contract.

Sir Frederick Hopkinson.—I have found the reference to moorum. In Sir George Buchanan's estimate of 1919 he gave 1,830,000 yards, and in his report of February 11th he gave 3,360,000 yards.

A.—Thank you.

Mr. Billimoria.—You are referring to the agreement. I shall read one other clause: " Work in India. During the whole period the execution of the work shall be closely supervised by the firm, and Sir George Buchanan shall devote the greater part of his time to this particular work." Does that mean that he had to devote a longer time, and that

your opinion, which may be worth a good deal in your own sphere, does not count having regard to that agreement?

A.—I do not read the agreement to mean that he had to spend the greater part of his time in Bombay. After all he had a lot of work to do, and he was engaged on the Back Bay work in this country.

Q.—After the reclamation work had started, what was he doing in this country?

A.—He had a great deal to do. There was all this question of ordering the plant, and matters of that kind—there was a lot of work entailed in that—and all the correspondence with the Department.

Q.—You have no knowledge of the interview with the Secretary of State?

A.—None.

Q.—Turning to page 19, you state : " There are ample quantities of filling material in the Harbour and Back Bay."

A.—Yes.

Q.—Where do you get that information from?

A.—From the evidence.

Q.—That is also hearsay?

A.—I am taking it from the evidence.

Q.—I ask you to give instances of what you base your conclusions on, and I say you base your conclusions on hearsay—nothing from your personal knowledge or experience?

A.—One gets one's knowledge from reading.

Q.—That is hearsay; that is not personal knowledge.

A.—Well, am I to understand that I should not believe anything I hear with regard to the quantities of material in the Harbour and Back Bay unless I went there and bored the site myself and took all the sections? Is that what you infer?

Q.—No; but what you are suggesting here is that there are ample quantities. I want to know where you get that from, from your own knowledge, or from what somebody has told you about it?

A.—From what I have read. There are all the original quantities which have been taken out from Bombay, both in the Harbour and Back Bay. This afternoon the quantities have been mentioned here as being 21,000,000 yards and 25,000,000 yards as the material available in the Harbour and Back Bay, which makes 46,000,000 yards. Apart from the bulking of the material in the reclamation, the figure usually given as the required amount to dredge is 25,000,000, which is only about half the quantity which is available. So on those figures I do base this statement, " There are ample quantities of filling material in the Harbour and Back Bay."

Q.—So that you honestly believe there are ample quantities of material?

A.—This information has been sent home by the Engineer out there. Why should I doubt it?

Q.—Could you then explain the cause of the failure of the scheme?

A.—I do not admit that there was a failure of the scheme.

Q.—This was a scheme that was expected to be completed in 1926. We are at the end of the year 1926, and there is no sight of the end of it at all. This was a scheme that was expected to be completed on an estimated figure of 367 lakhs; and now it could not be completed, irrespective of interest and depreciation, for anything less than 1,000 lakhs. Should you not call that a failure?

A.—I do not admit those figures.

Q.—What figures would you admit?

A.—The nearest figures that I should take from the evidence—that is all that I have to go on—are the figures I have put down.

Q.—Do you mean the figures on page 21?

A.—Yes.

Q.—How do you base your calculations there? Where do you get the figure from of 470 lakhs, and so forth?

A.—I take that from the evidence.

Q.—How do you arrive at 606 lakhs?

A.—By adding thereto the Development Department's estimate to complete the works, amounting to 39 lakhs, and to that again the dredging, at a working cost of 7 annas, which shows an improvement of 1 anna per cubic yard for a part on what they state in the evidence it has cost. Multiplying 21,000,000 yards by 7 annas gives you 93 lakhs; and the total comes to 606 lakhs.

Q.—In reply to Sir Frederick Hopkinson you have already admitted you have assumed certain things. It is on a certain assumption that that data has been based. What is the value of the assumption and the estimate based on it?

A.—It is taken from the evidence. It is stated in the evidence that the cost of dredging was 8 annas.

Q.—Not all round?

A.—That is how I understood it when I read it.

Sir Frederick Hopkinson.—It is harbour dredging only?

A.—Is this harbour dredging only?

Q.—Yes, 8·3.

A.—8 annas 3 pies.

Q.—That is all. That is harbour dredging only?

A—On that, on their own statement in the evidence that they can improve the output by 50 per cent., I am right in assuming that if the output is improved, the unit cost will come down.

Q.—Assuming their assumption is realised?

A.—On the evidence given that they are working 15 hours a day instead of 24.

Q.—They had no intention of working 24 hours a day when they made that assumption?

A.—I gather you have recommended it.

Q.—That is subsequently?

A.—Yes. That shows that my view coincides with yours, that 24 hours should be worked. That is 50 per cent. increase in time.

Q.—No, it is not.

A.—And if they state that the dredging is costing 8 annas 3 pies, and if they are to improve the output by 50 per cent.——

Sir Frederick Hopkinson.—No, they are not. They do not expect to; they do not hope to. I should not expect them to.

Sir M. Visvesvaraya.—They have already said that they worked longer hours than 15, but all they can pump is for 15 hours?

A.—Clearly if they worked the whole day round instead of working 16 hours only, there must be an improvement. I also see they stop for meals.

Sir Frederick Hopkinson.—You would not expect to get the same results at night that you get in the daylight, as a practical man?

A.—Then you would not, perhaps, get the same efficiency at night.

Q.—Of course you would not.

A.—But you can get over the great drop in efficiency, which I understand Mr. Settle is going to produce evidence of, by making it worth while for the men to do their best. That is a point which I consider very important indeed. That helps to level up the difference between efficiency at night time and during the day time.

Mr. Billimoria.—I will ask you one simple question. If your figures are based upon something which has been assumed, and that assumption is not correct, the results that you arrived at are absolutely incorrect, is not that so? If you have assumed something and that assumption turns out to be incorrect, your conclusions are incorrect?

A.—It depends to what extent they are incorrect. If there is only a slight difference, the difference in the total will be small, but if there is a great difference between 606 lakhs, which I suggest here, and the estimate for the engineering works of 1,000 lakhs, which you put——

Q.—You think by dredging the whole work is completed; but there are overhead charges and various other expenses which you have not taken into consideration. There are various other things to be done before you can complete the work. None of those figures have you taken into account in arriving at your figure of 606?

A.—Have not I taken that from the Development Department estimate?

Q.—The cost of dredging does not include the entire cost of the reclamation. Even assuming the 7 annas, it is only the cost of the dredging. That does not mean the whole reclamation expenditure?

A.—It does not include everything, as I think I have made quite clear in my statement.

Q.—You say the total cost of completing the reclaimed area?

A.—It is only for the items which are in my statement. That is only for the filling.

Q.—You say: " The total cost of the reclamation at about 606 lakhs of rupees and without allowing credit for the sale of plant "?

A.—That is excluding moorum, filling, and the town planning. I think I have made that quite clear in my statement.

Q.—Your statement speaks for itself. These figures are merely assumed figures and have no bearing on the question. On page 20 you take exception to the action

taken by the Bombay Government with regard to the Advisory Committee being appointed to investigate the activities of the Development Department with its Chairman, the Director of Development. Why should you take exception to that?

A.—It seemed to me to be a curious thing if the Bombay Government appointed, as I understand it, an Advisory Committee to investigate the activities of the Development Department, that they should appoint as its Chairman the Director of the Development Department. That is all. It seems to me to be rather curious.

Q.—He would help the Committee a good deal with his personal knowledge of the inner working of the Department. He would place the facts and the materials before the Committee so that it could come to a definite conclusion. It is usually done by the Government of India in all Departments. When the Legislative Council brings forward a proposal in the House it is always the General Member or the Member in charge of the particular Department who presides over the deliberations of that Committee so that he can help them.

A.—The idea is somewhat strange to me. I would have thought that the Director of Development should have given his assistance in giving evidence before that Advisory Committee, and not been its Chairman. That is the only point. It struck me as being rather curious.

Q.—It is not unusual.

A.—You tell me it is not unusual in India.

Q.—At the conclusion of your note on page 21 you say: "The area to be reclaimed is 1,145 acres, or 5,541,800 square yards," and you base your calculation on 20 rupees a square yard on the whole area. You must be aware that the area available for building sites, after providing for roads and open spaces, is only 22 lakhs, and therefore your figure of 11 crores has no bearing whatever on the scheme being commercially successful?

A.—I have taken this from the evidence. I had a doubt whether I should go into this at all, because it is outside my province, but I could not help putting it in as I was rather impressed by the figures. Is not it the case that they are getting 20 rupees per square yard for the military area?

Q.—It is quite true, but not for the whole of the area.

A.—That is a large part.

Q.—That shows how imperfect your knowledge of the whole case is, that you have based your calculations upon something of which you have no personal knowledge. Then you have forgotten one of the principal items, namely interest and depreciation. Does not interest form a very important factor for consideration with regard to making a project profitable or otherwise?

A.—I state here I have excluded interest, in the last line.

Q.—That is so. If you were to take interest into account when you know that the project is going to take years and years for completion, that project can never be a success commercially if interest piles up year after year. You will agree with me that no such project could ever be a success under such circumstances?

A.—Well, as you say, it is rather outside my province, this question of land values, so that it would not be right for me to say that I agree with that without going into it in detail.

(The Witness withdrew.)

57th Witness, Mr. J. Risley Settle, M.Inst.C.E.

Written Statement.

1. My experience in the design and construction of large civil engineering works has been obtained, as follows:—

The Manchester Ship Canal, from inception to completion, 1882 to 1894;

The Admiralty and H.M. Gibraltar Dockyard Extension Works, inception to completion, 1894 to 1908;

Messrs. Topham, Jones and Railton, Ltd., Public Works Contractors, 1908 to 1916;

Director of Naval Works to the Commonwealth Government of Australia, 1916 to 1922;

and since 1890 or 1891, when the two small bucket dredgers, "Medlock" and "Irk," I believe they were named, were erected ready for work in the bottom of Salford Dock, up till 1922 I have been more or less closely connected with bucket and cutter suction dredgers and dredging operations.

2. In accordance with instructions received from Messrs. C. S. Meik and Buchanan, I proceeded to Bombay to look into the question of the dredging in connection with the reclamation of Back Bay.

3. I arrived in Bombay on 8th November, 1925, and left there on 5th December, 1925, on my return to London.

4. On Monday, 9th November, in company with the Chief Engineer (Mr. Elgee) and the Deputy Chief Engineer Dredging (Mr. Brims), I inspected the intermediate pumping vessel " Colaba," which was working in tandem with the " Sir George Lloyd," pumping dredged material into area No. 8 of the reclamation at Colaba. On approaching the vessel, when at some little distance from it, I noticed a movement of the outer casing of the fore funnel and an agitation of the water around the vessel which extended for some considerable distance fore and aft, due to the excessive vibration when pumping. Shortly after arrival on deck, at the invitation of the Chief Engineer of the dredger, and under his guidance, I examined closely the defects in sight, caused by the vibration, on deck, in the engine and boiler rooms, including the engine seating, the plating of the oil tanks, and some parts of the bilges. After the inspection Mr. Brims asked me what I thought of it. As he had told me previously that the matter had been referred to the local experts of the Royal Indian Marine Dockyard, and as I had no executive authority but was merely inspecting on behalf of my firm, I did not feel at liberty to state more than that; as the defects were under the consideration of the Royal Marine officers, it was for them to give their views. Had I been vested with authority I should not have permitted the vessel to work, and it was a matter of surprise to me that Mr. Brims permitted work. That Mr. Brims was uneasy was clear, for he asked me for my views more than once. Ultimately, the Chief Engineer (Mr. Elgee) decided that the vessel was to be put out of commission for repair on the termination of the second shift, or at midnight of that day.

5. Pumping operations for season 1924-25 finished at midnight on 15th May, 1925, and were resumed at the end of October, 1925, for season 1925-26. On the 9th November, after pumping for only 178¾ hours, or not for more than two weeks, following a lay-up period of about 5½ months, the " Colaba " was again laid up for repairs which should have been done during the previous lay-up period, as, in so short a time, the defects due to the vibration of the vessel could not have become worse than they were on 15th May, 1925.

6. If the local expert opinion had been obtained in May, 1925, it would most probably have recommended, in addition to the lattice stiffening of the deck sent out by Messrs. Wm. Simons and Co., the same work for remedying the effects of the vibration, as they recommended in the November following, and thus the loss of at least 17 days' dredging would have been saved.

7. The " Kalu," after dredging fruitlessly through the season 1924-25 at a spot in Back Bay, resumed dredging operations on 15th November, 1925, at a different spot from that of the last season, though Mr. Brims informed me that she was dredging the sand which had accumulated in the hole dredged the previous season. On the resumption of these operations, the material was pumped into Area I at Marine Lines. Up to the time of my last visit to the " Kalu " the material pumped was being taken out to sea by the ebb tide. The facts above stated indicated to me that there was no proper supervision, and that no interest was taken in the work.

8. No tests whatever of the pipe-line discharge had been taken prior to those taken during my visit. It is usual to make periodical tests where suction-dredging operations are being carried out, even when the work is known to be satisfactory, but it is imperative to take tests when the operations are not satisfactory, as they are the only true day to day guide as to what is taking place and what is the cause of it. Intelligent direction and supervision of dredging operations such as these are impossible without the guidance of periodical tests of the discharge, as, no matter how frequently made, mere mechanical visits to the pipe line and dredger do not help to solve the problem involved in unsatisfactory operations. Suggestions for the taking of tests and the arrangement for the payment of a bonus to the men of the dredger were made in our letter dated 23rd April, 1925, and further in connection with the bonus in our letter dated 26th February, 23rd July, and 16th September, 1925.

9. I formed the opinion during my visit that Mr. Brims and Mr. Speirs, Senior, were spending far more time at Mazagon Dock, four miles away, in connection with the reconditioning of the " Jinga " than was good for the dredging. During a visit to Mazagon Dock with Mr. Brims, he told me that he and Mr. Speirs, Senior, spent much of their time there, and that he had the privilege of going into the shop at any time, day or night, and of giving the shop workmen his own dredging work to do, whatever they might be working on at the time. My reply was that his work would have to pay for the privilege. During discussions with Mr. Brims on the dredging operations he repeatedly informed me that so much of his time was taken up with the filling up of forms of one sort or another required by the Department that he could not possibly give as much time to dredging as he would like. He stressed this so much on one occasion that I asked him which he considered the most vital—successful dredging

operations or filling up forms. As he replied dredging operations, I advised him to give his whole time to the operations and leave his personal assistant to deal with the forms. The dredging section had no workshop ashore at Colaba for dealing with the usual minor and moderately large dredging repairs, nor was the workshop at Colaba belonging to the reclamation section, which was well equipped with suitable machinery and power, availed of by the dredging section, the reason given being that it was under the charge of the reclamation section.

10. I spoke to Mr. Brims about working the dredger in shifts for the full time daily, but he replied, " It cannot be done," and when I asked " Why," he replied that it is against the Factory Acts, and also that three shifts could not be accommodated on board the dredger. I replied that it would pay to hire a vessel with the necessary accommodation to lie off near the dredger.

11. During my visit I remarked to Mr. Brims and Mr. Billington (the then Deputy Chief Engineer Reclamation at Colaba) on the apparent lack of co-ordination between the various sections, when I was given to understand there was none. On the occasion of Mr. Brims introducing me, on the works, to Mr. Billington, he told me that he had not seen Mr. Billington to speak to for 18 months.

12. I append hereto copy of my report, dated 30th December, 1925, to Messrs. C. S. Meik and Buchanan on my visit to Bombay in connection with the dredging and reclamation of Back Bay.

13. As questions have been raised before the Committee on the practice of proceeding with the lay-out for and construction of large civil engineering works, such as the Back Bay Reclamation, it might be helpful if I state what has been my experience on this point, and therefore I give the following particulars of the procedure adopted in the cases of the Manchester Ship Canal and H.M. Gibraltar Dockyard extension works.

14 *The Manchester Ship Canal.*—This work was let by contract in 1888 to the late Mr. T. A. Walker. At the time of the letting of the contract the only details of the canal that had been prepared were :—

(*a*) The trigonometrical, detailed and geological surveys, including levels of the canal route and five main line deviation railways;

(*b*) the staking out of the centre line of the canal and its cross-section widths for excavation purposes, and similarly for the deviation railways.

I believe I am correct in stating that only part of (*b*) was completed on the date of the contract.

Consequently the designs and working details of the locks and sluices, docks, wharves, jetties, river sluices, railway bridges and viaducts, road bridges, opening and fixed, including high-level bridges, the Mersey Estuary embankments forming the north side of canal, road, storm water and sewer diversions caused by the interception of the canal, and other subsidiary works, were prepared subsequent to the signing of the contract. The additional information of the sites required for the designing of the above items of work was obtained on the ground during the period of the contract.

The estimated cost of the canal and its subsidiary work was, I believe, about £6,000,000 at the time of signing the contract, and its cost in 1894 about £12,000,000, including purchase of land, compensation for severance, &c., and its total cost, £15,000,000.

It is my considered opinion that had even a portion of these works been designed and the usual contract plans and documents been prepared before inviting tenders, the canal would not now be in existence, for the time required to design the works and prepare the contract documents would have been so great that not only the public interest in, but also the enthusiasm for, the scheme, which had been kept alive during the period 1882 to 1887, would not have survived.

15. *His Majesty's Gibraltar Dockyard Extension Scheme.*—The works comprising this scheme, with the exception of a 300 feet extension of the existing mole, which was let by contract, was started in 1885 by Admiralty departmental labour and continued till December, 1898. The scheme at that time included only one dry dock with the necessary reclamation, a further extension beyond the contract length of the existing mole and a detached breakwater. The designs and details for these works were prepared by the staff in Gibraltar and submitted to Admiralty for approval.

Some of the plant and temporary works for the carrying out of the permanent works were considered in London by the Senior Officer and an assistant, who ordered the plant and sundry materials before proceeding to Gibraltar to take up their posts in charge of the work. Other plant and materials found necessary as the work developed were ordered as required from Gibraltar. These works were estimated to cost, I believe, $1\frac{1}{4}$ million sterling.

The increasing requirements of the Admiralty demanded increased naval accommodation at Gibraltar and as it was considered that Government procedure was not

sufficiently elastic to permit of the enlarged scheme to be carried out departmentally, it was decided to let the works to contract. Consequently, contract drawings and documents were prepared, tenders invited, and contract was let in December, 1898. The contract drawings did not cover all the subsidiary works required, and consequently special provision for them had to be made for their execution; the designs and working details of some of them were prepared by the local staff during the period of the contract and submitted to Admiralty for approval. The works were completed in 1907 at a cost of about 5½ millions sterling.

In connection with the questions raised before the Committee on the horse-power of the " Sir George Lloyd " as being a factor in its output, it was stated that the cause of the low output lay in the difference of the horse-power between the horse-power of the American dredger proposed by Mr. Kidd and the horse-power of the " Sir George Lloyd." The true reason for the difference of the respective horse-powers will be found most probably to be that in American practice the horse-power is the total horse-power of the vessel, that is, of the propelling engine, pumping engine, winches and ladder engines and the various auxiliary steam units which together make up the complete steam unit, or, in other words, the horse-power of the boilers. In the case of the " Sir George Lloyd," the horse-power given was that of the pumping engine only.

27*th October*, 1926.

Report of Mr. Risley Settle on his Visit to Bombay, 1925.

16, Victoria Street,
Westminster, S.W.1.
30th December, 1925.

Messrs. Meik and Buchanan,
16, Victoria Street,
London, S.W.1.

Dear Sirs,

Further to my report of 12th November, 1925, the Chief Engineer decided, on Monday afternoon, 9th November, to cease work with the I.P.S. " Colaba," on the completion of the second shift at midnight on that date, and consequently to move the dredger " Sir George Lloyd " to the dredging area west of Oyster Rock, where it was expected dredging operations would be resumed towards the end of the following week. Arrangements therefore were made at once to move the dredger and so much of the pipe-line as was required immediately to the west side of Oyster Rock, and dredging operations were resumed on Wednesday afternoon, 18th November, but efficient work was not done till Saturday, 21st idem.

As the object of my visit to Bombay was to get a grip of the fundamentals of the dredging position and problem, it was impossible to obtain these owing to the temporary cessation of dredging, except to note generally the operations of moving the dredger and assembling and reconnecting the pipe-line for work in the new position. I therefore used the major portion of this interim to inspect the construction works and quarry and to try to obtain as much information as possible of the material in the dredging area lying to the east of Oyster Rock. My object in obtaining this latter information was particularly great, because I found from time to time, when generally discussing the dredging question, that the admittedly unsatisfactory position of the dredging was due to one or all of the following three causes :—

(*a*) The unsuitability of the material.

(*b*) The difficulty of obtaining the material owing to the uneven level of hard material, moorum, which the dredger cannot deal with, and consequent loss of much time in lifting and lowering the cutter.

(*c*) The unsuitability of the men, assistant dredging masters, &c., sent out from London.

When generally discussing the dredging and its unsatisfactory conditions with the Chief Engineer on Tuesday, 10th November, he told me that he thought everything had been done that could be done to improve the position, and it had only to be considered that the work was being directed by two experienced men like Brims and Speirs, especially Speirs, and he himself was not without dredging experience, to realise what had been done with regard to dredging the material in the dredging area. I told him that, if possible, I would like to obtain a sample of the mud of the dredging area without its coming in contact with the water and have it analysed for its physical characteristics.

After discussing the difficulties which he said stood in the way of obtaining this information, and my mentioning that the material might be referred to Mr. Mitchell for analysis, he said he thought that there was no need to refer it to Mr. Mitchell as it could be done in his office. I have brought back with me two samples of the material obtained by Mr. Speirs, Senr., and myself for physical analysis, if it be considered desirable. The samples are in two cigarette tins, hermetically sealed with solder, so that the material might be kept as far as possible in its natural condition. I have also

brought samples of the clay as obtained from the solid material discharged and heaped up around the discharge pipe ends.

I told him that I had read a letter in the office file of correspondence from Mr. Lewis, his predecessor, to Sir George, in which Mr. Lewis stated, in reference to the material in the dredging area, that " it had been reported on unfavourably by technical experts," and I asked him if he knew anything of the report or who the technical experts were. He replied that he did not and he could not say whether or not it was Mr. Mitchell. In the afternoon (Tuesday) Mr. Brims and I called on Mr. Mitchell at his laboratory and we had a long discussion with him on the suitability of the material, for dredging and reclamation, which is being dredged in the harbour. I explained to him the difficulty, as represented by the Chief Engineer and Mr. Brims, there would be in obtaining Government sanction to the expenditure of funds necessary to refer the sample of the materials to him for analysis, when Mr. Brims said : " To do so would undoubtedly raise very awkward questions at the present time and generally affect the works politically, and it would probably be asked why it is now considered necessary at this late stage to analyse the materials, which, if necessary at all, should have been done at the commencement." I told Mr. Mitchell that as the unsuitability of the material from the dredging point of view is being repeatedly put forward as an explanation or cause of the unsatisfactory output, and particularly as Speirs, Sr., asserts " that the first 10 feet below the surface of the ground is all silt, very largely organic, which, when dried out, is blown away by the wind," it is very desirable to obtain some definite physical information or tests of the material, and I asked him if he could help, under the circumstances, by giving in general terms his opinion on the matter. Mr. Mitchell said he had not tested the material in the area of the harbour being dredged over by us, but he considered there should not be any material difference in the nature of the materials from those in the area tested by him for the Bombay Port Trust, and he would be pleased, if the Engineer to the Bombay Port Trust had no objection, to let us read his (Mr. Mitchell's) report, or perhaps the Engineer himself might give us a copy of the report. Mr. Mitchell, in further explanation, said that all the material in the harbour had been brought down by the same creek or creeks, so that the material in our dredging area would be similar to but finer than that in the Bombay Port Trust area, as it is farther down stream than the latter. He therefore believed that the mud or silt was extremely fine sand and in a more or less buttery condition, and consequently, he thought, could not be considered the best material for reclamation purposes. It had a great affinity for water and could not under its natural condition of lying in the reclamation, be made to give up its water content. He stated very definitely that he did not agree with Speirs' opinion, as the material in the harbour was of trap rock. I told him about Mr. Lewis's remarks with reference to the unsuitability of the material, and asked him if he had tested and reported on the material. He said he had not, and he thought that if the material had been tested he would have been asked to do it, or he would have known something about it.

As the result of the interview with Mr. Mitchell, Mr. Elgee arranged an interview with Mr. Maclure, the Engineer to the Bombay Port Trust, for Thursday, 12th November. After introducing me to Mr. Maclure, the Chief Engineer returned to his office, and Mr. Maclure and I fully discussed the material in the dredging area. He generally confirmed Mr. Mitchell's opinion, and in reply to my request for a copy of Mr. Mitchell's report, or failing this to give his approval to Mr. Mitchell letting me read or take a copy of the report, he agreed to the latter, and said he would notify Mr. Mitchell accordingly. Mr. Mitchell later on lent me his unsigned copy of the report, and he ultimately agreed conditionally to my retaining the copy I made of the report for our office use only. A copy of the report is appended hereto. Mr. Maclure during my interview with him showed me the tabulated and graphed results of extensive experiments which, under the direction of the Port Trust, had been carried out to ascertain the bearing power of the material in the reclamation at Sewri. He said the material itself was unstable and always would be, owing to its water content, but if topped with good moorum filling, not less than 3 feet 6 inches in thickness, he considered any light loading would be well spread and safely borne. This thickness, however, he considered quite insufficient for roadways intended for fast motor traffic or moderately heavy weights. He knew instances of the moorum topping disappearing out of sight shortly after it had been deposited, without leaving a trace of what had occurred.

The southernmost area of the Colaba reclamation is being surfaced with moorum to the finished level of the reclamation. The work was commenced on Thursday, 13th November, by tipping wagons of moorum, 100 daily, from the wall, the material being spread by contract coolie labour.

The construction plant is being assembled for repair and overhaul preparatory to being sold.

The Chief Engineer and I visited the quarry at Kandivlee on Saturday, 14th November. We were met at the station by Mr. O'Rorke, who drove us to the quarry by car, and we then walked over the quarry and through the workshops. Quarrying opera-

tions have ceased, but the excavation of moorum and filling it into wagons was in progress by contract coolie labour.

I inspected the various grades of hardness of moorum, and am of opinion that the two or three softer varieties overlying the harder moorum, if the moorum within the dredging area is similar, should be dealt with without much difficulty by the " Sir George Lloyd." Mr. O'Rorke informed me that the estimated quantity of suitable moorum filling available in the quarry is about one-seventh of the total required to complete the reclamation assuming the dredging is stopped, and that the remaining six-sevenths can be obtained without difficulty on land adjoining the quarry for which a royalty of one anna per ton would have to be paid.

The contract rate for excavating and loading the moorum into wagons at the quarry is 4½ annas per ton as weighed on the weighbridge.

The Chief Engineer, as soon as he joined me in the train at Marine Lines Station on our way to the quarry, informed me that he had received instructions to attend with me and Sir Lawless Hepper a conference with Mr. Cowasji Jehangir, at 2.30 p.m., at the Treasury Office, on our return from Kandivlee.

After being introduced to Mr. Jehangir, he spoke about the very unsatisfactory position and the heavy cost of the dredging. He was very pessimistic as to its success, and asked me what I thought of it. I told him that owing to the temporary stoppage of dredging operations due to the " Colaba " being put out of commission for the present, I had had no opportunity of observing the working of the dredger except for a short time on Monday last. He said the dredger had been working now for two seasons, and had failed to give the output she should have given and as was expected, and we were responsible. I replied, the dredger had only worked two seasons or equivalent to an actual dredging period of at most 10 months in all, with scratch crews at the commencement of the work. The 10 months' work was done in two periods of only about five months each, with a lay-up period of about seven months between them, thus breaking the continuity of the work and, therefore, the best results could not be expected as such a method of procedure is not helpful to efficient team work in the early stages of each period of the work. He said, " Well, you knew of these conditions." I further stated that as the dredger was not designed by us but by Sir John Biles, the Naval Architect to the Government of India, we were not responsible for any failure in connection with the dredger itself. That she was not only designed, but inspected during construction and tested by, and the trials conducted under the supervision of, Sir John Biles, who also, on the completion of satisfactory trials, issued the necessary certificate for the taking over of the dredger by the Government of Bombay. He then asked, " What did you, Sir George Buchanan do in connection with the design." I replied " Gave the class of material to be dealt with and the hourly output required." This at the moment seemed to satisfy him. He then asked, " why has she not given the output." I replied that, assuming the material to be dredged is suitable and in sufficient depths, I saw no reason why she should not repeat the output obtained during her trials provided she were properly handled and fed. He asked, " why was she not fed properly." I replied that a large and powerful machine, like the " Sir George Lloyd," can only be efficiently worked by good team work led by an able dredging master. He then wanted to know why they had not got them, i.e., good masters, and said Meik & Buchanan are responsible for the appointments of the masters. I replied, " No, as the men were advertised for by the High Commissioner for India." I then fully explain to him the arrangements—the appointment of a selection committee—made by the High Commissioner with the object of interviewing and selecting the most suitable applicants for the appointments. The Selection Committee comprised Sir Edward M. Cook, the late Secretary to the High Commissioner, the Assistant Secretary and myself representing Messrs. Meik & Buchanan, who were requested by the High Commissioner to nominate a representative to advise on the technical merits of the respective applicants. I emphasised the fact that the Selection Committee of three comprised two high officials of the Government of India and also that, speaking from memory, only one of the applicants had had in a small way actual suction dredging experience. He then asked, "Why could we not get better men." I replied they were probably not available. One reason might possibly be that the salaries offered were insufficient to attract the best men. He said with some surprise, " Then why was not more money offered and why did you not raise the question? " I replied we had nothing whatever to do with the question, the salaries and conditions of appointments were dealt with entirely by the High Commissioner for India. He then asked, " Why was not the matter referred to us? We would not have raised any objection to giving a substantial increase and will do it now if we can only get the men to give us the output and reduce the very high cost of dredging." He asked, " What salary would you recommend and what salary would be paid in England? Could any of the experienced men in dredging at Liverpool be obtained? " I replied the salary paid in England would be considerably less than paid here owing to the work being at home and not abroad, where probably the expense of another home

would be necessary. I also said I considered it would be much better to adhere to the present salaries and encourage the men to give better team work service by letting them feel that they were directly and liberally concerned in the output by being paid a good bonus. He said, I thought a little excitedly, " We are quite prepared to give then the bonus that has been recommended." Turning to Mr. Elgee he asked him to make it known that a bonus would be paid and to arrange accordingly.

He then referred to the " Colaba," and asked if I knew about the " Colaba " and what I thought about the report received from the Naval Architect and Engineer. I replied I knew about the " Colaba," but I did not know anything about the report. He said, " Have you not seen it? " I said, " No," as I understood it had only just been received. (Mr. Elgee here said the report had only been received in time to have a copy made to send to London.) He then asked me if I thought the " Colaba " could be put right in a fortnight. I replied I did not think it could. He then asked, " Can it be done in a month? " I replied it might possibly, but whatever is done it should be carefully considered.

He and Sir Lawless Hepper then discussed what they should do, and it was decided to send off a telegram on the matter.

Mr. Cowagsee Jehangir finally asked me when I was returning to London, and I replied in a fortnight's time after the resumption of dredging operations. He said, " But that is too short a time for any purpose." I replied I should not leave until the purpose for which I came out was completed.

Sir Lawless Hepper made some remark to him which I did not hear, but Mr. Jehangir replied that he was going away and would not return till (I believe he said) the 5th December. He then shook hands with me, and, bidding me good-bye, the conference closed.

As I heard that the Chief Engineer of the I.P.S. " Colaba " (Mr. Smith), during his recent visit home on leave, had been approached by Messrs. Simons on the matter of the " Colaba," I visited the " Colaba " again on Wednesday, 11th November, and tried to get from him what took place between him and Simons. He was very reticent and I got nothing definite from him. I told him that it appeared to me, from his replies to my questions, that Messrs. Simons must have got very little, if any, help from him. He said in reply, " I did not know how any information I gave might affect the position." I said, " Do you mean your position here? " He said, " No, generally." He told me, however, that a Mr. MacGreggor, an official of Messrs. Simons, sent a message to him through his (Smith's) brother, who was an employee of Messrs. Simons, asking him (Smith) to go to see him (Mr. MacGreggor). When Smith went to the works, there were with Mr. MacGreggor the chief draughtsman and another official. I inferred from his general or evasive answers to the questions I put to him, that he was well questioned as to the conditions of the " Colaba " and that they, Messrs. Simons, were much concerned about her.

When going round the construction works at Marine Lines on Monday, 16th November, with Mr. Abdulla, the Assistant Engineer, I noticed that the ebb-tide running out under the wall was carrying with it a large amount of pumped material, as the water on the sea side of the wall was very discoloured and heavily loaded with material in suspension for a considerable distance out from the wall and for a distance of about 400 feet on either side of the discharge pipe. I later on informed the Chief Engineer about this, who made some remark that I understood to refer to material pumped in the reclamation last year. I said material is being pumped in the reclamation now, and I thought it was necessary to retain all that was pumped. I also informed Mr. Brims of this, who, I believe, verified it, and after discussing it with the Chief Engineer, obtained, so Mr. Brims informed me afterwards, his approval to the tipping of a dozen wagons of moorum from the wall on the inside of the rubble mound. This quantity I considered wholly insufficient to cover the mound even with a thin layer.

Material, excavated from a site or sites in the town, was being tipped by motor lorry in the reclamation at two points—one near Marine Lines Depot, and the other immediately north of the cross bunds at Church Gate Railway Station—by a contractor. Mr. Abdulla informed me that he thought the material was costing about Rs. 4 per ton deposited in the reclamation.

On Tuesday, 17th November, I accompanied Mr. Brims to the Mazagaon Dock Company's works to inspect the " Jinga," which is being reconditioned and fitted out as the intermediate pumping station to the " Kalu," in the Company's dock at their dockyard. A large number of men were employed on the work, and the Company's works manager in reply to Mr. Brim's question stated that he thought they would finish the work on the " Jinga " in about three months.

The Works Manager (Mr. Rasmadden, I believe, is his name) pointed out to me the broken cutter of the " Sir George Lloyd." As I saw there was only one rib broken I suggested to him that the broken rib should be burnt on and built up by the quasiarc process, as it was a valuable piece of machinery and when repaired would provide a spare

cutter in case of further accident. He made no reply. Later on I spoke to Mr. Brims about it, but he said. " It can't be done." I told him I differed, as it is a very frequent occurrence at other places, as I have many times seen, and no reason is apparent why it should not be done here and save the expensive cutter from being sold for scrap value. I would suggest this matter be referred to Messrs. Simons for an opinion.

As dredging operations were expected to be resumed on Wednesday, 18th November, I accompanied Mr. Brims to Colaba to commence the discharge tests. On arrival we found that pumping had not commenced, and after waiting some time at the end of the discharge pipe-line, we left for the " Sir George Lloyd " to ascertain the position. We found the laying out of the moorings had not been completed, so we decided to visit the " Kalu " in Back Bay, as, owing to the tide, she would be unable to continue dredging after 2 p.m. On arrival, we found Mr. Speirs on the bridge and, whilst we were on board, he directed the operations. I understood from Mr. Brims that the " Kalu " was dredging the sand, which had accumulated during the last monsoon, from the hole she made during last season's work, the material in which, also according to Speirs, was sand. I told Mr. Brims that Mr. Abdulla informed me on Monday last that the " Kalu " was working in a new position about 1,000 feet out from her position of last year. He made no reply. When on board the " Kalu " on 2nd December, the Marine Surveyor came on board to take her position by sextant bearings. After he had plotted her position on the Chart I asked him what her present position was in relation to her position of last year, and he told me that as she was dredging a cut about 200 feet wide her position was 800 to 1,000 feet away from her position of last year.

Pumping operations by the " Sir George Lloyd " were resumed on the afternoon of the 18th November, though only clear water was pumped whilst the dredger was getting up to the old face of the previous dredging. On visiting the pipe line at Colaba early on Thursday morning, 19th idem, it was found that clear water was still being pumped, but as the afternoon advanced, the discharge became more heavily loaded. Mr. Brims said it would be Monday before a good working face was obtained.

As full bore could not be obtained even with clear water, due probably to the pipe line being 5,900 feet long and not 5,000 feet, the two gauges of the pitot tube would not register, as they were not sufficiently sensitive.

The pitot tube was fixed again on Friday morning for the taking of tests, but before a reading could be taken the tube was badly bent and put out of action by solid material in the discharge striking it. It was removed for repair and strengthening and for the fitting of a gauge glass to the tube instead of the pressure gauges. In the meantime the jet was very carefully measured and the results are included in the attached tabulated statement of tests.

Mr. Cole, who had arrived from Bhuj, Kutch, on Saturday last, and I had an interview with His Highness, The Maharao of Kutch, at His Highness' request, at the Taj Mahal Hotel at 3 p.m. on Friday, 20th November. The proceedings of the interview were reported in my letter dated 20th idem.

After the interview I returned to Colaba to watch the discharge from the dredger.

On Saturday morning, 21st idem, I went to the pipe line at Colaba, where I stayed some little time watching the discharge of material before going off to the dredger. The discharge was well loaded with material and a large quantity of clay had accumulated around the end of the branch pipe used during the second shift yesterday. The clay had been delivered in more or less round balls from 18 inches diameter and downwards. It was of a stiff consistency, as walking over it and even jumping on to it from the top of the pipes made only a very slight impression upon it. I then left for the dredger, where I arrived about 11 o'clock and remained on board to the end of the shift, finally leaving about 3.30 p.m. and returned to the pipe line to see the result of the day's dredging. The result was, I considered, very satisfactory, as there was a considerable quantity of solid material, clay, heaped up for some distance around the pipe end, and there was ample evidence that a very considerable amount of disintegrated material had been carried in suspension into the water area of the reclamation. The whole of the material being pumped into this area No. 8 is being retained, the clear water flowing to sea over the top of the eastern return end of Drain No. 1.

As dredging, on its resumption, was now considered to be in full operation, it was decided to commence the definite tests of discharge on Monday, 23rd November, and arrangements were made accordingly. The tests were taken on alternate days—four days in all—two tests per day, one of the day shift and one of the night shift, making a total of eight tests. These are shown in the tabulated statement. From this day till the completion of the taking of the tests on Tuesday, 1st December, nearly the whole of my time was spent on the tests and on the dredger.

As a telephone service was not provided between the end of the discharge pipe line and the dredger I pressed that one should be installed at least during the tests. As difficulty after difficulty was raised against the installation of a telephone service I suggested that it would pay to lay a submarine cable from the shore to the ship, but the usual reply that " it can't be done " was received. I replied again that it has been done

at other places, in two cases less favoured than Bombay, and it can be done here. Ultimately a line was laid along the discharge pipe and it was found useful during the tests.

The results of the tests are given in the tabulated statement from which it will be seen that of 9 No. tests, 5 No. gave an absolute minimum discharge of over 1,000 cubic yards per hour, the maximum being 1,552 cubic yards, with a pipe line 6,410 feet long.

This result, considering the length of the pipe line, was very satisfactory, and given a reasonable working face and proper feeding it shows that the dredger is generally capable of giving satisfactory output in accordance with the designed capacity.

Precipitation tests were also taken of the discharge of the day and night shifts which showed that the efficiency of the night shift output was only approximately 69 per cent. of that of the day, though the greatest individual percentage output (91·90) was obtained during a night shift, the greatest during the day shift was 79·64. These tests were relative only.

During a temporary stoppage of pumping at Colaba on Friday, 27th November, due to increasing the length of the floating pipe line, Mr. Brims and I ran up by car to Marine Lines to see the material, at low water, which had been pumped into the reclamation area by the " Kalu." We arrived there about 3 p.m., it was about low water, approaching springs, but the tide was still ebbing. In the enclosed area between Main Drains 8 and 9, which was nearly clear of water, comparatively wide and deep channels were scoured out in the surface, presumably the original foreshore, by the water flowing out of the area to sea through the rubble mound of the wall as the tide ebbed, clearly indicating the large percentage of voids in the rubble of the mound and the total inadequacy of the small quantity, 10 or 12 wagons, I believe, of moorum which had been tipped on the inside slope of the mound a few days previously with the object of preventing the escape to sea of the pumped material. On this date there was very little trace of moorum on the lower portion of the mound, any that had been there must undoubtedly have been carried out to sea on the ebb tide. I called Mr. Brims' attention to the discoloured and apparently heavily loaded state of the water on the sea side of the wall over an area of about 800-900 feet along the face of the wall and nearly the same distance out from it. When I saw the Chief Engineer on Monday afternoon I told him of this and again suggested that every effort should be made to retain every ounce of the pumped material. He said he had already given instructions for more moorum to be tipped

On visiting the " Kalu " again on Wednesday morning, 2nd December, I found the same state of affairs existing, and on returning to the office after lunch I mentioned it again to Mr. Brims and Mr. Elgee, when the latter said he gave orders last week for the tipping of moorum along the wall. Mr. Brims gave me to understand that he had had some little difficulty in getting the Chief Engineer's approval to the tipping of the 10 or 12 wagons of moorum.

On Thursday afternoon, 3rd December, I discussed, as previously arranged, on the completion of the tests, the general question of dredging with Mr. Elgee and Mr. Brims in Mr. Elgee's office. I generally explained the tests that had been made and the inference to be drawn from them. And though the pitot tube had failed us, reliance having been placed on one tube only, without spares, we had fortunately been able to measure carefully, and with accuracy, the discharge jets at the end of the pipe-line. I said that though no dredging test had been carried out under actual specification conditions owing to the discharge pipe varying in length from 5,900 feet to 6,640 feet, instead of 5,000 feet, I nevertheless considered that, judging from the tests, the dredger was quite equal to the designed duty. Mr. Elgee and Mr. Brims said that was their opinion also. With regard to the material to be dredged from the dredging area on the east side of Oyster Rock, I related the particulars about the sample of the mud Mr. Speirs, Sen., and I obtained on Tuesday evening last, and, as the result, I stated definitely that the views generally expressed about the material, particularly by Messrs. Brims and Speirs, were not supported by the sample of the material then obtained, and that I considered the materials, except moorum, and their extent almost ideal for suction-pump dredging. Further, Speirs' oft-repeated statement that the first 10 feet layer of mud over that area was no good for pumping was, in my opinion, exploded by the sample obtained. Speirs admitted that the sample of the material was better than that at Sewri, his remark being: " I could not have believed it." The Chief Engineer asked how many samples were obtained. I replied one..

I then submitted the following suggestions, which were generally discussed:—

(*a*) Working the dredger continuously without stopping for meals.

Mr. Brims argued that this was quite unworkable, and he was generally supported by Mr. Elgee.

(*b*) Fixing telephone and maintaining it in working order between the dredger and the end of the pipe-line.

Mr. Brims argued against this, and said that they had found it better to work with arranged signals between the dredger and I.P.S. " Colaba " than to use the telephone which had been provided.

(*c*) Foreman in charge of pipe-line to keep a log book, and enter therein all advices to the dredger.

Mr. Brims argued against this, and stated that he did not think it necessary.

(*d*) Foreman in charge of pipe-line to take samples daily of the discharge, say one during the morning shift and one during the night shift, at varying times from day to day, for the purpose of testing the proportion of solids in the graduated gauge glasses. Relative tests only.

(*e*) Mr. Surveyor to take, say twice weekly, systematic tests of the discharge to obtain the velocity, percentage, and hourly discharge of solid materials (Mr. Surveyor is fully competent to carry on these tests). Absolute tests.

(*d*) and (*e*) Very little non-committal comment was made.

(*f*) To raise, by means of sand or moorum in bags, a weir on the top of the shore-end part of Drain No. 1 or, by other means, to trap all the solid materials being pumped into Area No. 8 at Colaba.

Mr. Elgee said this would require to be carefully looked into, otherwise the southernmost portion of the reclamation, where moorum is now being tipped, would be under water. I learnt before I left Bombay that it had been decided to tip moorum on the remainder, the eastern end, of the inside slope of the cross bund between Areas 7 and 8.

(*g*) The employment of an engineering inspector to supervise the work of reconditioning the " Jinga " and so relieve Mr. Brims and Mr. Speirs, Sen., from this work to enable them to give their whole attention to dredging. Mr. Brims had previously informed me that much of his and Speirs' time was taken up with this work.

Mr. Brims strongly argued against this, and quoted some decision on a similar matter in Mr. Lewis' time.

(*h*) The percentage of solids discharged during the night shifts was only about 70 per cent. of that of the day shift.

When I first informed Mr. Brims of this some few days previously he expressed surprise. He now said that Speirs said it was generally found to be the case.

I then asked if they had any other matters or points in connection with the dredging on which I might possibly be able to assist. Mr. Elgee and Mr. Brims replied they thought not.

I informed them that the greater part, if not the whole, of the water area of reclamation, Area No. 8, into which the dredgings are being discharged, was very heavily loaded with material from the dredger, for on Tuesday, 1st instant, I obtained the loan of the " Mosquito " punt and men to take me as far as possible over the water area, when it was found that, owing to the density of the water, the men were only able to paddle the punt about 50 feet away from the landing place.

The water or, more correctly, liquid mud level was 87·20 feet.

Mr. Surveyor, who ably assisted in taking the tests, asked me to recommend him to the Chief Engineer for an increase of salary, and, in accordance with my promise to do so, I took advantage of this interview to recommend Mr. Surveyor for the consideration of an increase of salary. The Chief Engineer replied that Mr. Brims, who was present, had some time ago recommended Mr. Surveyor for an increase, but nothing could be done at the time. After a little reflection he added, " If Messrs. Meik & Buchanan will recommend him for an increase, I will see what can be done."

If this procedure is in order, I would recommend Mr. Surveyor's request for an increase of salary for favourable consideration.

As much has been said about the unsuitableness of the men, assistant dredging masters, &c., sent out from London, or, as Speirs, Senior, told me, by Messrs. Meik & Buchanan, I have had ample opportunity of watching the dredging masters, Roberts and Speirs, Junior, of the " Sir George Lloyd," during dredging operations between Saturday, 21st November, to 1st December, inclusive.

During the frequent visits I paid to the dredger between those dates, Roberts showed himself alert, intelligent and fully capable as a dredging master of the " Sir George Lloyd." On the occasions of my calling his attention to the vacuum gauge he has at once given the reason for its low indication. Whatever may be the cause of his unsuitableness—and his name is the only name which has been mentioned in this connection, though when reference to unsuitableness has been made it has been connected with the words " of the men sent out from London or by Meik & Buchanan " —it cannot, in his case, include incapacity as a dredging master of the " Sir George Lloyd." I was reliably informed of one occasion, after completing his dredging shift, of his visiting the pipe-line to see, as I understood he said, the progress made.

I told the Chief Engineer on Monday, 30th November, that I had watched Roberts carefully during dredging operations and I considered him a good dredging master. His only comment was, " What do you think of young Speirs? " I said there was a difference between the two men; Speirs did not handle the dredger with the same ability as Roberts. Subsequently, on my next visit to the dredger, I asked Speirs for how long he had been out in Bombay; he said two years, and in reply to further questions said he came out straight from the bench and had had no previous dredging experience. He has had, therefore, prior to this season's work, at most 10 months' actual dredging experience, spread over two periods of five months. He is now one of the two dredging masters alternatively responsible for the day and night shift working of probably the most powerful suction cutter dredger afloat.

The Chief Engineer, in his letter No. 854 of 20th March, 1925, stated that " it takes 10 years at least to train a man to work a suction dredger satisfactorily . . ."

Roberts is a 1st class Board of Trade Certificated Engineer, and was one of a number of applicants carefully selected by a Selection Committee, whereas the only qualification of Speirs, Jr., is that of having been at the bench as a fitter.

My visits to the " Kalu " were altogether too short to enable an opinion to be formed of the ability of the two dredging masters, Wallace and Brown, of this vessel owing to her working for only short periods of time daily during the days the tides were favourable.

When in the engine room of the " Kalu " I called the Chief Engineer's (Mr. Carr's) attention to a " knock " of the engine, when he said, " Yes, but it's not bad; it just wants lining up." I said, " Well, why not put a liner in and prevent its getting worse? " He replied, looking round the engine room, " We have no means of doing these things." I said, " You mean you have no workshop." He said, " Yes."

On a previous occasion I called Mr. Rutherford's (the Chief Engineer of the " Sir George Lloyd ") attention to a somewhat worse " knock " of the dredger's engine (Pump engine). He said, " It is not too bad." I said, " I suppose it will have to go ashore." I did not hear his reply.

It is not creditable to the ship's engineering staff that these small but important working defects should not be adjusted before the next week's running of the engines.

At noon on Friday, 4th December, I had, as previously arranged, a final interview with Sir Lawless Hepper. It had been arranged between the Chief Engineer and myself that he should be present at the interview, but at the last moment he said he thought it would be better if I had the interview alone with Sir Lawless.

After a few introductory remarks Sir Lawless asked me if I was satisfied with the dredging. I replied as the results of the tests, " Yes."

No further question in connection with dredging was asked, and the remainder of the interview was taken up by Sir Lawless in giving me interesting incidents of Indian life as he had experienced it.

Before leaving and on my bidding him goodbye he asked me if Sir George had not been for some time in Australia. I replied that he had been in Australia. He finally said, " Well, please remember me to him," after which I bade him goodbye and withdrew.

I embarked at 11 o'clock on Saturday, 5th December, on board the P. & O. " Ranpura " on my return to London, where I arrived on Saturday afternoon, 19th inst.

Recommendations.

As there seemed to me during my visit to Bombay to be a settled feeling that the dredging problem presented some inherent difficulty or difficulties, as exemplified by the remarks of the Chief Engineer quoted on page 2, supra, and that the direction and super-

vision seemed to lack intelligent direction and " life," I beg to submit the following recommendations for consideration as I feel sure that if a well-directed and reasonably energetic trial be made of some or all they would in a short time improve the tone and atmosphere of the work and lead to an improvement in the dredging output :—

1. That belief in the dredger's ability to do work at least equal to her designed capacity to be encouraged.

2. That the material to be dredged over the larger dredging area, east side of Oyster Rock, should be considered to be very much better than it is or has been believed to be, and that it is almost ideal for dredging.

3. That where hard moorum crops up, it should be left to be dealt with by blasting or other means if it is necessary to dredge it to obtain the quantity of material required for filling.

4. Provision of telephone between the dredger (Bridge) and the end of the pipe line.

5. Foreman in charge of pipe line should keep a log book and note therein advices made to the dredging master in connection with the condition of discharge.

6. The taking of absolute tests of the discharge, say, twice weekly, to obtain the velocity, percentage (absolute) and hourly discharge of solid materials. Mr. Surveyor is fully competent to take these tests.

7. That percentage of solids discharged during the day and night shifts should be obtained for comparison.

These tests are very simple and take very little time to carry through and should be taken daily and recorded. The results from time to time tactfully told to the respective dredging masters, day and night shifts, unconsciously cultivates a spirit of emulation. I know this has been a considerable factor in increasing the output.

Mr. Surveyor and Brooks, foreman of pipe line, fully understand all the little that is required to carry out these tests, which are relative only.

8. The employment of an able Marine Engineer, solely responsible under the Chief Engineer, to the Engineer in charge of dredging, to take charge of the whole of the maintenance work of the plant and so relieve Mr. Brims and Mr. Spiers, Sr., of this work to enable them to give the whole of their time to dredging proper.

Yours faithfully,

(Sgd.) J. Risley Settle.

Precipitation tests of the day and night shifts' discharges giving the relative percentages of solids in the discharge.

Day Shift. *Percentage.*	*Night Shift.* *Pencentage.*
—	22·41
15·84	18·27
—	14·38
40·75	12·92
22·50	14·91
79·64	14·63
18·60	91·90
23·03	26·75
71·95	24·25
7)272·31	9)240·42
38·90	26·71
100	68·66

The efficiency of the night shift during the period of these tests was only 68·66 per cent. of that of the day shift.

Day.	Date.	Time.	Tide.		Revolutions of pump per minute.	Pressure in lbs. per square inch at pump.	Equivalent head in feet at pump.	Vacuum in inches.	Depth of cutter in feet.	Total length of pipe line.	Velocity of discharge in feet per second.	Equivalent head in feet.	Discharge.				
			Spring.	Neap.									Total per hour.	Solids.		Specific gravity.	General nature.
													cube yards.	Per cent.	cube yards per hour.		
Thursday ...	19.11.25	3.30 p.m.	$\frac{1}{3}$ ebb	—	—	—	—	—	—	5,900	10·75	1·82	9,192	11·93	1,097	2·28	clay and sand.
Friday ...	20.11.25	11 a.m.	—	—	—	—	—	—	—	5,900	10·60	1·75	—	—	—	—	—
		12.30 p.m.	—	—	—	—	—	—	—	5,900	10·87	1·85	—	—	—	—	—
		„	—	—	—	—	—	—	—	5,900	11·49	2·03	—	—	—	—	—
			—	—	—	—	—	—	—	5,900	11·22	1·97	—	—	—	—	—
Monday ...	23.11.25	12 noon	—	low water	144	36	81·00	—	—	6,070	8·92	1·24	7,628	5·77	440	2·28	—
		4 p.m.	—	$\frac{2}{3}$ flood	145	34	76·40	+	46	6,070	11·22	1·97	9,594	11·03	1,058	2·23	clay and sand.
Wednesday	25.11.25	12 noon	—	$\frac{2}{3}$ ebb	146	34	76·40	13	30	6,210	11·41	2·02	9,757	15·03	1,466	2·22	„
		5 p.m.	—	$\frac{1}{2}$ flood	143	34	76·40	12	35	6,210	10·54	1·74	9,013	5·83	525	2·26	„
Friday ...	27.11.25	11 a.m.	$\frac{1}{6}$ ebb	—	144	31	69·60	11	45	6,350	11·09	1·92	9,483	9·12	865	2·17	„
		5.30 p.m.	$\frac{1}{4}$ flood	—	145	36	81·00	$9\frac{1}{2}$	31	6,410	11·34	2·01	9,697	16·01	1,552	2·21	„
Tuesday ...	1.12.25	12 noon	high water	—	143	36	81·00	12	52	6,580	11·81	2·18	10,097	12·33	1,246	2·18	„
		4 p.m.	$\frac{3}{3}$ ebb	—	146	37	83·20	11	40	6,640	13·18	2·71	11,269	6·44	725	2·29	„

NOTE.—As the samples of the discharge were taken from approximately the centre of the jet, only material in suspension was obtained and consequently no account was taken (or could be taken) of the solids being discharged with lower velocity along the invert of the pipe. It is, therefore, reasonable to assume that the quantities of solids discharged given above under "Cube yards per hour" might be increased by 10 per cent.

The percentage of solids discharged were obtained after "drying out" over a spirit lamp the residue of solids measured in a graduated test glasss; and, therefore, the "cube yards per hour" of solids discharged is the absolute minimum quantity of solids discharged at each test.

Chairman.—I think you went to Bombay in 1925?
A.—Yes.

Q.—And eventually you made two reports to your firm, Messrs. Meik and Buchanan?
A.—Yes.

Q.—In the second document which has been placed before us, dated the 30th of December, 1925, you say: " My object in obtaining this latter information was particularly great because I found from time to time, when generally discussing the dredging question, that the admittedly unsatisfactory position of the dredging was due to one or all of the following three causes ". Then you set out, as the first cause, the unsuitability of the material?
A.—Yes.

Q.—That must mean, must it not, the unsuitability of the dredger to deal with the material?
A.—I beg your pardon. It was the unsuitability of the material to be dealt with by the dredger.

Q.—Is not that, as Mr. Kidd says, putting the cart before the horse, because the material is an eternal factor, is it not?
A.—It is.

Q.—You cannot alter the material. Whatever it is, there it is?
A.—Yes.

Q.—Therefore you have to adapt your dredger to your particular material?
A.—Yes.

Q.—So be it. The second cause, you say, is: " The difficulty of obtaining the material owing to the uneven level of hard material, moorum, which the dredger cannot deal with, and consequent loss of much time in lifting and lowering the cutter "?
A.—Yes.

Q.—You have got a certain depth of mud, below the mud a certain depth of clay, and below the clay, moorum and rocks. No matter how carefully borings are taken, you cannot guarantee that in any particular place you will have a perfectly level bed beneath the mud and clay?
A.—That is so: it is uneven.

Q.—It is always uneven, and the most skilful dredging master in the world will suddenly come upon a piece of rock?
A.—That is so.

Q.—And if, by chance, he injures the blades of the cutter it is no fault of his?
A.—No.

Q.—It is due to the fact that, however carefully borings are taken, owing to the irregularity of the moorum and rock, you may suddenly come upon rock?
A.—That is so.

Q.—And then the skilful dredging master passes over it. He has got to lift up?
A.—He has got to lift up, or else he breaks his machine.

Q.—He has to lift up because his cutter cannot go into this hard stuff?
A.—Yes.

Q.—Therefore he lifts the ladder, and gets it again on to dredgable material, and goes on dredging until he comes on to harder material. When he gets into the harder material he lifts again?
A.—Yes.

Q.—I notice in your report that you say that the breaking of the cutter is not a matter of unusual occurrence?
A.—Not at all. I did not wish to infer that it was.

Q.—I notice that, and that you wanted them in Bombay to have it repaired by the quasi-arc process?
A.—That is my point.

Q.—And that if they did have that one blade of the cutter repaired they would have had a spare cutter?
A.—Exactly.

Q.—You do not suggest that because you find one blade of a cutter broken that therefore there has been a careless or a negligent dredging master?
A.—No. I am sorry if I have given that impression.

Q.—You have not given that impression in any way.
A.—No.

Q.—The first point that you found them insisting upon was the unsuitability of the material?

A.—That is so.

Q.—The second point was that they found that the depth of dredgable material was uncertain?

A.—Yes, uneven.

Q.—Then the third matter, what has been called the human element?

A.—Yes.

Q.—That is when you have got to get together a crew to work a machine like a dredger sometimes you have got to train the crew?

A.—Yes.

Q.—It may take a little time. Sometimes you have bad luck in not getting a good dredging master.

A.—Yes.

Q.—Sometimes you have good luck in getting one. Do you know anything about Mr. Speirs? He was a very good man, was he not?

A.—Well, he may have been.

Q.—He was recommended, and strongly supported by the firm of Meik & Buchanan, was he not?

A.—I believe he was.

Q.—And strongly supported by Messrs Simons & Co.?

A.—Yes, I believe he was.

Q.—That is right. The only quarrel that you have with Mr. Speirs is his old age, is it not; he is getting on in years?

A.—Yes, and I think also his mentality. He has got his own ways of doing things, and no one else knows anything at all about them.

Q.—After all he was a dredging master who all his life had been doing that job and nothing else?

A.—That is so.

Q.—Have you any doubt but that he was wanting to get the best results out of the Sir George Lloyd "? He was very proud of the " Sir George Lloyd," was he not?

A.—I do not know about that I am sure; I never asked him.

Q.—We have seen him?

A.—He took pride in it, I admit.

Q.—We asked him if she was not a very good ship, and he said she was the finest dredger he had ever seen. Have you any reason to doubt that Mr. Speirs did his very best to get the best result?

A.—In coming into contact with these men and discussing points with them one forms an idea as to whether they are the right men for the position. It is not always possible to find definite circumstances or definite details upon which one can take action.

Q.—We know what the position was with regard to him. Then you had a certain conversation with Mr. Brims, and Mr. Brims wanted some of the material analysed; you remember that?

A.—No, I wanted it analysed.

Q.—You wanted it analysed?

A.—Yes.

Q.—Did Mr. Brims say something like this in reply: " Well, if we have this analysed now it will raise all sorts of awkward questions, because people will say, ' Why have you not done this years ago?' "

A.—Yes. Mr. Brims made that statement when I was speaking to Mr. Mitchell.

Q.—That is right?

A.—I was trying to get information.

Q.—And a very sage remark, was it not?

A.—I believe so now, but of course I could not realise the importance of it at the time.

Q.—Had there been a little more attention paid to the quality of the material from October, 1919, to May, 1920, the result might have been very different to-day?

A.—I do not follow that.

Q.—The report of Sir George Buchanan was in September, 1919. There were calm conditions of weather in Bombay in October, November, December, January, February, March and April. The dredger was ordered in May. Sir George Buchanan has told us that it would have been perfectly easy to have taken check borings in October, November

and December, and have ascertained exactly the nature of the material; do you follow that?

A.—Yes.

Q.—Would not that have been an eminently wise thing to have done?

A.—It would in a sense, but I think the information given in Mr. Kidd's plan was quite sufficient. In my opinion it is sufficient for forming an opinion as to the material.

Q.—Are there other methods of boring which give definite information of the materials?

A.—Yes, core borings.

Q.—Core borings bring up samples of the materials bored through, do they not?

A.—Yes.

Q.—Exactly, and core borings could have been taken in one month, in the month of October or in the month of November, which would have shown you exactly the quality of the mud. You would have brought the mud out?

A.—Exactly.

Q.—You would have brought the clay out?

A.—Yes.

Q.—You would have known whether you were dealing with soft clay or stiff clay. You would have known exactly what you were dealing with. You would have known exactly when you were coming on to the moorum, and as regards the consistency of the mud and the consistency of the clay, core borings would have told you exactly what you wanted to know?

A.—They would, yes.

Q.—And then in addition to that, borings of that character would have shown you the nature of the silt, and whether Mr. Mitchell and Mr. Maclure, and all these other people were right when they anticipated that it would never dry out. You would have been able to find that out too, would you not?

A.—Yes, but there is no question about the drying out below water level. I have seen acres and acres of reclamations formed of bad material, and I have dealt with reclamations where the material has been extremely bad, and it has been dried out in the process of reclaiming.

Q.—Yes. At the Sewri reclamation they were not able to dry it out at all because they were pumping landwards?

A.—Yes.

Q.—Have you noticed in the evidence that Mr. Maclure, speaking of the Sewri reclamation, says that even to-day the land in parts is like a blanc-mange? Have you been on the Sewri reclamation?

A.—No, I have not.

Q.—Did Mr. Maclure tell you himself that the land at Sewri was unstable?

A.—Yes, I mentioned that in my report.

Q.—Did he tell you that it always would be unstable.

A.—Yes, it would always be unstable; that is where it is below the hydraulic gradient.

Q.—And that as regards moorum you wanted no less than 3 feet 6 inches in thickness?

A.—That is what Mr. Maclure told me, and that was based on experiments they carried out under the Bombay Port Trust.

Q.—And that even with 3 feet 6 inches of moorum it would not carry more than a light load?

A.—That is so.

Q.—That is not a business proposition, is it, to reclaim land that is like a blanc-mange, on which you have to put 3 feet 6 inches of expensive moorum. Moorum is very expensive, is it not?

A.—I believe so.

Q.—You have to put on it expensive moorum and then that reclaimed land will carry only a light load?

A.—Then the question arises, in considering a pumping and reclamation scheme, as to whether there is cheaper process. I know of reclamations in Australia where the mud is infinitely worse; I use the word " infinitely " because I cannot conceive anything worse for reclamation purposes than the mud in the top or north end of Hobson's Bay. The whole of the West Melbourne swamp was reclaimed with this mud. Victoria Dock is built on part of it.

Sir Frederick Hopkinson.—Can you conceive of any worse mud than that in that tin below the table?

A.—I have not seen the tin, but I have samples myself.

Q.—Will you look at that and stir it up?

A.—This has passed through the dredger?

Q.—It has?

A.—Of course that is more solid at the bottom. I went out in the "Mosquito" punt . . . . . .

Q.—You could not have any worse stuff than that?

A.—I have never seen anything else come through for reclamations.

Q.—You could not have anything wore than that, could you?

A.—Yes.

Q.—What could it be?

A.—The Melbourne silt is worse than that.

Q.—Has it any sand in it?

A.—It has particles of sand.

Q.—Then it could not be worse than that because sand is an improvement. There is practically no sand in that?

A.—I understand that the silt is impalpable sand; it is all washings down.

Q.—The water will run out of sand, but it will not run out of mud? Sand is granular but that is not?

A.—That is its first condition, of course. It would be in the form of clay.

Q.—I do not suppose there is one per cent. of granular matter in that?

A.—I have seen worse than that. The whole of West Melbourne swamp is made up of worse than that. I also know a suburb of Melbourne, a place called Elwood, lying between South St. Kilda and North Brighton, made of worse than that, and it has very fine palatial buildings erected on it.

Sir M. Visvesvaraya.—Is that due to salt efflorescence?

A.—Salt efflorescence?

Q.—Yes. Is the soil to which you refer impregnated with salts?

A.—Yes, it is sea water.

Q.—That must be the reason.

A.—They topped it and they drained it. In reclaiming they had weirs, and they drained off the water and allowed it to precipitate, and then after it had dried out in the hot Australian sun they topped it with hard material. I have seen much worse material than that.

Chairman.—Do you remember going up to Marine Lines with Mr. Brims to see what the "Kalu" was doing?

A.—Yes.

Q.—Did you notice for 800 or 900 feet along the face of the wall, and nearly the same distance out, that pumped material was escaping?

A.—Yes, I did.

Q.—Was not it evident to you that a very large percentage of the pumped material was escaping through what was an extremely porous wall?

A.—Naturally that is the case, and that is why I called attention to it. I could not understand the condition of the wall.

Q.—Exactly. One of the objects of the wall is to retain the material that is pumped into it?

A.—Yes. I should certainly blame the Resident Engineer for that. It shows that he did not know his job.

Q.—The Resident Engineer has to work to specification?

A.—He had the specification. Of course that brings in a very large question. One wants to go back and to inquire what was the arrangement at that quarry. Were they quarrying for small stone or were they quarrying for large stone.

Sir Frederick Hopkinson.—No amount of mixing will make a loose stone rubble mound watertight?

A.—I have seen it done.

Q.—Have you?

A.—I have; with core; with run of quarry core.

Q.—It is a miracle if you have.

Chairman.—We are much indebted to you for your statement, which we will incorporated in your evidence. Those are the only questions which appear to me to be material as far as I am concerned.

Sir M. Visvesvaraya.—In the last paragraph, on page 5 of your statement, you say : " It is my considered opinion that had even a portion of these works been designed and the usual contract plans and documents been prepared before inviting tenders, the canal would not now be in existence, for the time required to design the works and prepare the contract documents would have been so great that not only the public interest, but also the enthusiasm for, the scheme, which had been kept alive during the period 1882 to 1887, would not have survived." You say " the enthusiasm for the scheme which had been kept alive." Of course you do not lauch such schemes on a wave of enthusiasm, do you?

A.—I cannot conceive of the Manchester Ship Canal ever materialising without that enthusiasm. I passed through the whole of that period.

Q.—Again, in the very last page of your statement you have made some remarks about the horse-power of the dredgers. Have you made any comparisions and deduced that the horse-power in this case was sufficient to pump 2,000 cubic yards per hour?

A.—I have not really, although I have a specification here of two 2,000 tons dredgers for which Messrs. Lobnitz got the contract in 1916 for the Commonwealth of Australia. They give the boiler horse-power there.

Q.—You have not gone into the question of the horse-power?

A.—Except, of course, when I was in Bombay I just ran it out from a 44lb. pump pressure. I ought to say that in taking these tests I got readings. I got the Chief Engineer of the dredger to take readings of the revolutions and the pressure at the engine, and also the vacuum. The highest pressure at the pump was 44 lbs. That is practically equal to 70 feet head. As a matter of fact it is just over 70 feet head. 70 feet head would give you a velocity of clear water of 12 feet per second at the end of 5,000 feet of pipe line. No, I am wrong in that. 44 lbs. is equal to 100 feet lift. 70 feet head at the engine would give you a terminal velocity at the end of the 5,000 feet length of pipe line of 12 feet per second.

Q.—Have you provided for the horse-power for the cutter?

A.—I am dealing with the pump engine. They are detached. If you add 50 per cent. for friction head to the 70 feet it would give you, say, 105 feet head. Here 44 lbs. pressure at the engine gives you about 100 feet head. That satisfied me, at all events, as to the sufficiency of the horse-power.

Q.—The suction pipe?

A.—Yes.

Q.—What about the cutter?

A.—There is ample power.

Sir Frederick Hopkinson.—That is a separate engine?

A.—That is a separate engine.

Sir M. Visvesvaraya.—Have you seen that the horse-power is sufficient for that.

A.—Yes, more than sufficient. Of course, she has an automatic cut-off. When the cutter comes up against anything hard the steam is automatically cut off.

Q.—The allegation is that the cutter does not cut the hard clay fast enough?

A.—I was on board. Of course, I cannot speak as regards the East side of Oyster Rock, but I spent a very large amount of my time on the dredger during the time that she was cutting in what was considered to be hard material on the West side of Oyster Rock, and I never saw the cutter brought up once. She cut everything before her, except moorum, when she was brought up.

Q.—She may cut, but at what rate?

A.—Of course, I cannot say, because no tests were taken at the time that I was on board.

Q.—You have not got definite figures?

A.—No. Naturally, if you get into hard material your output will decrease.

Q.—If you get into stiff material such as clay?

A.—No, the moorum. There was no hard material there except the moorum.

Q.—We have been told that the clay has been giving all the trouble, and not the moorum. They do not go into moorum except, perhaps, by accident, and then they at once shift their position?

A.—All round the end of the pipe on every shift I saw that there were balls of clay. I measured many of them. They were 18 inches in diameter and downwards, and that was extremely soft material. If it had been in the sun for three hours you could jump on it from the top of the pipe without making an impression.

Sir Frederick Hopkinson.—In the table at the end of your statement you gave the discharges on Thursday, Friday, Monday, Wednesday, Friday, and Tuseday, with certain

percentages of solid material. There are nine totals. At that time was the dredger working well?

A.—I can only form an opinion from the statements that I got from the dredger.

Q.—Were you on board at the time?

A.—Not at the time when the tests were taken.

Q.—You were not on board at the time?

A.—No, I was at the end of the pipe line.

Q.—Had you anyone to tell you if the dredger was working well?

A.—Only these statements; that is what I got. I got the Chief Engineer of the dredger to take them every half-hour, and give me the readings.

Q.—Do you think that the dredger was then doing as well as she could?

A.—I would not like to say. It is not so much the dredger doing as well as she could, but was she being fed properly?

Q.—Quite. That is part of her doing as well as she could. If she is not fed she could not do well?

A.—One wants to differentiate between a dredger doing well as a tool and a dredger being handled as a tool.

Q.—We are not interested in a dredger doing well as a tool. We are interested in her turning out 2,000 cubic yards an hour?

A.—If you get a good tool, and it is handled badly, you cannot get your output.

Q.—I notice that the average discharge on your figures is 997 cubic yards per hour?

A.—Yes.

Q.—That is what we complain of.

A.—I wanted to know why we could not get 1,552 cubic yards every time. If you can get it once, why not always?

Q.—This was taken by the samples, was it not?

A.—Yes, at the discharge.

Q.—That is the same as you use if you are pumping sand, is it not? What size tube was it?

A.—It was a graduated glass for measuring the precipitation of the solids. The jet at the end of the pipe line was measured.

Q.—Of what diameter?

A.—1½ inches diameter.

Q. It is very useful if you are pumping sand?

A.—Yes.

Q.—It is entirely useless if you are pumping lumps of clay 18 inches in diameter?

A.—You cannot take the clay at all.

Q.—Therefore this is absolutely unreliable and useless?

A.—Not so far as material in suspension is concerned.

Q.—That is no good. You want the clay?

A.—You cannot get the clay. There are no practical means of getting it.

Q.—It is impossible to test it in that way. The only real test is by cross sectional measurements of the dredging done, is it not?

A.—And that only over a long time.

Q.—Not a very long time; a week, say?

A.—No, you cannot get it in a week.

Q.—A month?

A.—No, you cannot get it in a month.

Q.—Why not?

A.—Simply because you have got the settlement to take account of. How can you take the settlement?

Q.—There is no settlement at all. You measure the cross sectional area of the work done, not the reclamation work, but the dredging work done?

A.—Yes.

Q.—Is it not possible to measure up accurately each day or two exactly what material has been dredged?

A.—Hardly, under the conditions that are obtaining out there. For instance, we used to run up behind the dredger and trace out the lines by means of sinkered barrels or buoys, and then set our wires across, and know exactly what we were doing.

Q.—The head chain on your dredger is absolutely taut, is it not?

A.—Yes.

Q.—Cannot you measure on that every time you go ahead, and cannot you, from the ship's deck, take your soundings as close as you like of the work accomplished behind you?

A.—Then what about the settlement.

Q.—Never mind about the settlement. I do not care about it. There is no settlement. You have got the level of the surface of the mud or clay before you touch it, and you have got the level after you have dredged it?

A.—Yes. I think if you took soundings a short time after the dredger had passed over the area your lead would probably sink in 18 inches to 2 feet.

Q.—Why.

A.—Because that has always been my experience.

Q.—Why should it?

A.—You have dredged the mud away, even with bucket dredgers.

Q.—You have dredged the mud away?

A.—That has always been my experience.

Q.—That would give a more favourable result. It would show that you had dredged more than you actually had?

A.—Of course, you know as well as I do that soundings, under those circumstances, would have to be taken very carefully.

Q.—Quite. I am assuming, of course, that they are done properly?

A.—You do not want to drop the lead over by the bridge.

Q.—I am speaking of proper soundings?

A.—If systematic soundings are taken properly then you can arrive at it, and it is the way of arriving at it.

Q.—It is the only way, is it not?

A.—Yes.

Q.—The speed of the effluent, I gather, was about 10 to 11 feet per second?

A.—Yes.

Q.—That gives a maximum output on a 42 inch pipe of about 13,468 cubic yards per hour, does it not?

A.—Yes, I believe it was about that.

Q.—Your table shows that your discharge varied between 5.77 per cent and 16.01 per cent?

A.—Yes.

Q.—I suggest to you that anyone doing pump dredging work is doing quite good work if he is getting 10 per cent., is he not?

A.—Yes, 10 per cent to 12 per cent.

Q.—10 per cent?

A.—10 per cent. to 12 per cent.

Q.—10 per cent. on 13,468 cubic yards an hour is 1,346 cubic yards an hour of solids?

A.—Yes.

Q.—And that is the maximum that your dredger can do?

A.—No, I would not like to say that. 1,552 cubic yards is given in the statement attached to my report dated 30th December, 1925.

Q.—Those are your figures?

A.—Yes, so far as they go.

Q.—Those are your figures. Turning back to the page before that, you have some precipitation tests of the day and nights shifts. You show there that the percentage of the night shift was 68·66 per cent. of the day shift?

A.—Yes.

Q.—That is about what you would expect, is it not?

A.—I do not know. I think I should expect a little more.

Q.—You would expect a little more?

A.—About 75 per cent.

Q.—You would expect about 75 per cent?

A.—Yes, properly worked.

Mr. Billimoria.—I have nothing to ask you.

Chairman.—We are much obliged to you, Mr. Settle.

(*The Witness withdrew.*)

(*Adjourned to to-morrow at* 11 *o'clock.*)

The Committee assembled at 11 a.m. on the 4th November, 1926, all members being present.

Sir H. Courthope-Munroe.—I regret keeping the Committee waiting a few moments Sir, but I have just heard from my client, Sir George Buchanan—or rather from his family—that he is seriously ill in bed. Under those conditions, it is impossible for him to attend. I need hardly say that he is most anxious that he should attend before this Committee, because there are a good many matters, which have not yet been dealt with in London, which were dealt with in Bombay at the time—when he had no opportunity of dealing with them, and which, in his own interests, he is most anxious to deal with before this Committee. Two questions remain. One is whether I should address you, as you have been good enough to permit me to do, on the construction of the agreement. I cannot help thinking that that is a matter which had better be dealt with at the close of the enquiry rather than in the course of it.

Chairman.—When you have the whole of the material before you and the result of your re-examination?

Sir H. Courthope-Munroe.—Quite. That is a very material matter, and one, I think, which must be dealt with at the close of the enquiry. The second question is this: I think it is essential that Sir George should be here to deal with those matters which are referred to in the shorthand notes, and the only point is when he will be sufficiently recovered to deal with them. I shall be seeing his doctor to-day, and I will ascertain what he thinks will be the earliest time at which Sir George can attend. I need hardly say that he is most anxious to attend, because, apart from what has taken place in London, there are numerous matters in Bombay which must be cleared up.

Chairman.—It would be a matter of great regret if Sir George left the examination in this truncated form. It is very important that he should be re-examined by you—most important. The Committee regret very much to hear that Sir George is ill, and we will meet his convenience in every possible way. I suggest, Sir Harry, that if Sir George's solicitors will give Mr. Ewbank 24 hours' notice we will attend here on any day next week it will suit Sir George's convenience. There will be a few more questions which Sir Frederick Hopkinson wishes to put, and a few questions which Mr. Billimoria wishes to put, and your re-examination, and then your view of the construction of the agreement. That can all be done within a day?

Sir H. Courthope-Munroe.—I think so.

Chairman.—Quite easily. We must arrange that it is done within a day; we cannot give any more time.

Sir H. Courthope-Munroe.—That is what I should myself wish.

Chairman.—Will you convey to Sir George Buchanan the real regret of the Committee at his having broken down. I think you might say that we noticed that he was under very severe strain on Monday and Tuesday.

Sir H. Courthope-Munroe.—That is why you were good enough to give him a day's rest?

Chairman.—Yes. Indeed, we noticed on Tuesday that he was under an increasing strain, and in our view that made it very desirable that Mr. Halcrow and Mr. Settle should be interposed. Now, Sir Harry, we had better leave it like that, I think?

Sir H. Courthope-Munroe.—If you please, Sir. I will convey your remarks to Sir George.

Chairman.—Your solicitors will give Mr. Ewbank 24 hours' notice—if they can give more, so much the better—of Sir George Buchanan's intention to attend; and I do suggest that, even if he attends under very considerable difficulty, he should nevertheless attend, because it is very important. His evidence is being no doubt regarded with great care in Bombay, and they will wish to have the whole story from him. We wish also to have such help from him as we can get, and also help from you in the re-examination.

Sir H. Courthope-Munroe.—If you please, Sir. I am obliged to the Committee.

Chairman.—Then the Committee adjourns until we hear from your solicitors as to the day on which Sir George will attend?

Sir H. Courthope-Munroe.—If you please, Sir. At the last meeting Sir George promised to give some information with reference to one of the pipe-lines for which you asked. He has put it on paper, and I will hand it in. (The document was handed in.)

(The Committee then adjourned *sine die*.)

The Committee assembled at 11 a.m. on the 12th November, 1926, all members being present.

The examination of Sir George Buchanan was continued.

Sir H. Courthope-Munroe.—Before you start the proceedings, Sir, may I call your attention to the fact that there is a clerical error in the shorthand notes on Thursday, October 28th, and as these are matters of record it had better be put right. It is on the last page, page 103, in the last observation that you made. After Sir George Buchanan had made that little sketch, giving the three divisions, you said, " This No. 3 is stiff unctuous clay. The other is the clay from No. 3 on the sketch of Sir George Buchanan ". That should be No. 2.

Chairman.—I have already crossed out " No. 3 ". That is obviously wrong. It should be " No. 2 ".

Sir H. Courthope-Munroe.—It is on record as No. 3, and, in years to come, it might be said, " What is the meaning of this? " It should be No. 2.

Chairman.—It will be corrected in the final proof. It is No. 2. This is clay from No. 2. Thank you, very much.

Sir Frederick Hopkinson.—(to the Witness) Simons' original quotation for the dredger was dated September 12th, 1919, I think.

Chairman.—Page 29 of your report, Sir George?

A.—Yes.

Sir Frederick Hopkinson.—You recommended the Bombay Government to place an order with Simons on February 26th, 1920, I think?

A.—Yes.

Q.—In your note of the same date you say, " No. 1 declined to tender ". That is Ferguson Brothers. " No. 2 wished for a great deal of information not available ". That is Fleming & Ferguson. Is that so?

A.—I have not got the papers by me, and I cannot tell you.

Sir H. Courthope-Munroe.—What page are you on?

Witness.—I do not know; I have not got the papers.

Chairman.—I suppose you will assume that that is so?

A.—I will assume that that is so.

Chairman.—It shall be handed to you afterwards.

Sir Frederick Hopkinson.—It is an extract from a letter of Mr. Mackie. You say that information was not available. The information they asked for is contained in their letter of the 22nd January, 1920, and the points are these: they wanted to know, first, the average working output; second, the length of pipeline; third, head against the pump; fourth, revolutions and diameter of pump impeller; fifth, velocity of material through piping. That was all essential information, was it not?

A.—We did not give that information, no.

Chairman.—The question is, " That was all essential information? That is the only question for the moment.

A.—They wanted to know that information, yes.

Q.—" Essential information "; that is the only question for the moment?

A.—Yes.

Sir Frederick Hopkinson.—They could not possibly give you a tender for the dredging plant without that information, could they?

A.—They would have to get it themselves.

Q.—No, no. They wanted to know how much an hour you wanted pumping. They could not tell. It must come from you, and, as a matter of fact, that is the information you gave the other tenderers.

A.—We gave the same to all tenderers. I cannot remember all these details now, because I was in Bombay.

Q.—Just follow it through with me. They were asking for information on the 22nd January—essential information which they had not got in their possession; and until they got that information they could not possibly quote, could they?

A.—I suppose not, no.

Q.—That information had been given to other tenderers. I want to ask you now whether you can explain why that information was not given to Fleming & Ferguson?

A.—I have not the faintest idea. I was not here at the time. I was in Bombay. It was conducted by Mr. Meik.

Q.—The fact appears to be that three of the tenderers were given information and that it was withheld from Fleming & Ferguson. Messrs. Lobnitz were given certain

information. The information which Messrs. Meik & Buchanan gave to Lobnitz was as follows. You sent to Messrs. Lobnitz: "Particulars, 2,000 cube yards an hour; discharge from dredger 5,000 feet; maximum length of discharge pipe 14,000 feet." Then depth, and so on, is all the same. "Character of material, soft clay."

A.—Yes.

Q.—Can you tell me why you gave them the maximum length of discharge pipe as 14,000 feet, whereas in fact Messrs. Simons' tender of September only provided for 8,500 feet?

A.—I think you are mistaken. It is 14,000 feet altogether.

Q.—No—"maximum length of discharge pipe 14,000 feet."

A.—14,000 feet from the dredger.

Q.—No. "Discharge from dredger 5,000 feet; maximum length of discharge pipe 14,000 feet," and on that information Messrs Lobnitz quoted for 19,000 feet of pipe, whereas Simons had only quoted for 13,500 feet. So there is a difference of 5,500 feet of pipe between the two. On the same note of 26th February, you say: "With regard to No. 3 tender, I have no details of Lobnitz's tender, nor is any time for delivery given; but I do not in any case see the necessity for two dredgers, and I recommend that Simons' tender be accepted"?

A.—Yes.

Q.—At that time did you know the amount of Simons' tender?

A.—Yes, certainly.

Q.—What was it?

A.—£451,000.

Q.—That was September. The Lobnitz tender is February?

A.—Yes, and Simons' firm offer terminated in March, I think.

Q.—Their firm offer was September. It was subsequently extended for three months on an additional allowance of 10 per cent.?

A.—Yes.

Q.—Therefore the price would not be £458,000? It would be 10 per cent. on top of that, would it not?

A.—Well, take it so.

Q.—That would only take you up to December. As you know, and as we all know, prices then were bounding upwards?

A.—They were, yes.

Q.—My suggestion to you is that on 26th February, 1920, when you recommended the acceptance of Simons' tender, you did not know the amount of their tender, nor did you know what Lobnitz were offering? As a matter of fact, Lobnitz were offering a totally different machine, or set of machines, from those quoted by Simons. Lobnitz's tender was for two dredgers capable of pumping 19,000 feet, each of the dredgers being capable of forcing 8,000 feet—19,500 feet in all. Therefore I want to see on what ground you recommended the Bombay Government to accept Simons' tender, which was totally different from Lobnitz's, and which you did not know how much it was?

A.—I would not like to say I did not know how much it was. In September they quoted that, and there was a three months' extension.

Q.—Not in September?

A.—The firm offer lasted until March.

Sir Frederick Hopkinson.—Can you refer me to that document?

Chairman.—I am looking for that. Would you turn to page 18 of your report? It says: "If ordered within three months from this date we will have the dredger ready for trials on the Clyde". That might be construed as being an offer to remain in existence for three months. Is there any other passage there with regard to the extension of that up to March?

A.—I feel quite certain it was extended up to March.

Q.—I think you are right about that, but when it was, and how it was, we do not know. As I say, I think you are right about that, because there is a letter of yours in which you mention the fact that there had been an extension to March, but whether there was on this date to which Sir Frederick Hopkinson is referring, is a matter which at present is not clear.

A.—I feel confident that at that time the firm offer went on to March, because naturally we wanted to take advantage of a firm offer of that description.

Sir Frederick Hopkinson.—But was not that subsequently altered by a letter in which they said they would require 10 per cent. extra?

A.—Yes, but even 10 per cent. extra at that time would have been a great bargain. Here is a letter. This all took place when I was in India. The three months was up in December. We wrote in London and asked them if they would keep the tender open.

We knew it was a favourable tender, and they said that they would keep it open for three months for 10 per cent. That is the 11th December. It was March.

Q.—How did you know it was a favourable tender?

A.—Well, we have a modicum of common sense, and Mr. Meik looked into it very carefully, and I still say it was a very favourable tender.

Q.—Had you any competitive prices?

A.—We had Lobnitz's.

Q.—No, no. This is before Lobnitz's case is seen at all. You say it was a favourable price in September, I am asking you the authority for that—any time from September to December?

A.—This was an estimate. Before we accepted this estimate we took in tenders.

Q.—No, no. That is not my question at all. You said just now that you knew it was a favourable price. I want to ask you why you considered it a favourable price?

A.—We knew it was a favourable price when we recommended——

Q.—No, no; that is going into next year. I am speaking of some time between September and December. How did you know it was a favourable price without competitive quotations?

A.—When did we recommend that it should be accepted?

Q.—February; but I am going on the statement you made just now. You said that before December you knew it was a favourable tender?

A.—I did not say that.

Q.—Yes, you did.

A.—Well, look here, let us get it plain. We took in this estimate as an ordinary estimate. We took an estimate from Simons for a dredger in the ordinary way in which engineers do every day of their lives. It was not binding; it was not an acceptance. It was an ordinary estimate. Before we recommended this tender for acceptance we took in prices from other dredger builders. When we had got the prices from the other dredger builders, Mr. Meik, who is now dead, cabled me out his opinion and the results. He did the whole of the work in taking out the tenders, and when we had got the tenders it was then that we recommended Simons. We did not recommend the acceptance of Simons's tender before.

Q.—Can you give us a copy of that cable which Mr. Meik sent out to you?

A.—I do not know.

Q.—Because it does not appear in any of the documents we have got. According to Mr. Mackie this is a note made by you on the 26th February, "No. 1 declined to tender." That is Ferguson Brothers?

A.—Yes.

Q.—"No. 2 wished for a great deal of information which was not available." I say that that was absolutely essential information and was given to the other tenderers. "I received a cable yesterday from my firm about No. 3"—that is Lobnitz—as follows: "Lobnitz tender of £840,000 for two complete dredgers each of 2,000 cubic yards capacity and pipeline, one dredger being used for intermediate station." Is that the whole of the information which you had from your office in London?

A.—If that is the cable, yes, I suppose it is.

Q.—There is nothing there about telling you what Lobnitz had quoted for, except that they quoted for two dredgers?

A.—Yes.

Q.—Before we go away from that I want an answer to my earlier question. You said just now that in December you knew Simons's was a favourable tender. I want to know how you arrived at that?

A.—I take that back. I say that we did nothing until we had taken in tenders.

Q.—Then that is withdrawn. The point is this——

A.—I see the point.

Q.— —that the tender of Simons's of 1919 was about four times the price of the "Kalu," and one is very nearly as big as the other.

A.—I am perfectly aware of that. Later on the matter was taken out of my hands. It went to the India Office. I actually did not know what price had been arranged for the dredger until it was all settled, and then the India Office wrote me a note saying, "We have arranged this and that and the other."

Q.—You could have no possible idea of what the dredger was going to cost? Surely the India Office and the Director-General of Stores would not accept a quotation for dredgers costing three quarters of a million without consulting you, would they?

A.—Yes, they did.

Q.—Another wonderful method of doing business, is it not? There is a letter from Messrs. Meik & Buchanan saying they cannot answer Fleming & Ferguson's question

about the quantity of material to be dredged, but they are sending a copy to you in India. Can you give me any idea why they could not answer that question, seeing that they had told the other people?

A.—I absolutely cannot tell you at this time.

Q.—It seems an extraordinary thing.

A.—It took place in 1919, and it was all done by Mr. Meik. If we could resuscitate Mr. Meik from the grave we could get a lot of information.

Q.—I suggest to you it is an extraordinary letter to write—that they could not tell Fleming & Ferguson what the dredger was expected to do on 23rd January, 1920. Now apparently the only information you had in Bombay on 26th February, 1920, was that cable from your firm in London?

A.—Yes.

Q.—They did not tell you there that Lobnitz's dredgers were 3,750 h.p. each, did they?

A.—No.

Q.—They did not tell you that Lobnitz's price included 19,000 feet of pipe? They did not tell you that Lobnitz's provided for double stage pumps, two engines on each boat, and that their pumps would deliver to 8,000 feet. They did not tell you any of that information?

A.—They did not tell me any of that. There was a memorandum made by Mr. Meik which came out at a later date.

Q.—That was after it was settled?

A.—Yes. I suppose it was after it was settled, but I still think that if we could have got Simons's tender accepted before the end of March it was an extraordinarily good offer indeed. If their tender had been accepted, even with it carried on for three months, they would probably have lost a great deal of money.

Q.—Actually their price was about £260,000, was it not, and of that they returned part to the Bombay Government, so there is very little difference between that and their price of September?

A.—There is a good deal of difference.

Q.—Their price in September was £249,000, and the cost price was £268,000, I think. That is about 10 per cent.?

A.—It is £182,000.

Q.—What, the dredger?

A.—The price in September for the dredger was £182,000—page 17.

Q.—£182,000 plus £17,000; that is £200,000?

A.—If I may say so, these questions about the increase in price of the dredger might very well have been addressed to Sir John Biles.

Q.—He had nothing to do with placing the order, with advising the Government of Bombay to accept the tender?

A.—I am talking of a later date when the firm offer of Simons had run out. When the time had run out, and we could not get the plant for that amount, it was then put into the hands of the India Office and Sir John Biles, and I take it that Sir John Biles had certainly been consulted about the price.

Sir Frederick Hopkinson.—We have no evidence that he was.

Chairman.—He has not said anything about that.

Sir M. Visvesvaraya.—He referred us to Sir George Buchanan.

Sir Frederick Hopkinson.—Before recommending the rejection of Lobnitz's tender in February, 1920, why did not you ask Simons what their price was in February, because, as you state, and as all we know, prices were bounding up at that time?

A.—We had got in prices in February.

Q.— No; you had only their price five months earlier?

A.—Yes, and we got their price in February. Their time did not run out till March.

Q.—Yes, their time ran out on December 11th?

A.—No, we got the extension.

Q.—Yes, for three months. We have no reference to that.

A.—I have just given the Chairman a letter.

Q.—That is to December?

A.—That is to March.

Chairman.—The letter is the 11th December, signed by Mr. MacMurray and extending the three months' time limit on an increase of 10 per cent.

A.—To March.

Q.—So that on an increase of 10 per cent. there was the option up to March, 1920?

A.—That was it, yes.

Sir Frederick Hopkinson.—Had you gone into the figures at all carefully you would have found that Lobnitz's tender was an actually cheaper tender per horse power than Simons' tender. Including the two dredgers and the 19,000 feet of pipe Lobnitz's price was £112 per horse power. Simons' price, as paid, and including 18,000 feet of pipe-line was £129 per horse power. If you take the dredgers alone without the pipe-line, Simons' price was £88 10s. 0d. per horse power, whereas Lobnitz's was £83 10s. 0d. per horse power with an effective radius of 8,000 feet, and had those two dredgers been there it looks as if none of this trouble would have arisen?

A.—Well, I have not got the figures.

Q.—I have worked them out from the actual prices paid and the estimates given?

A.—Very well. All I have to say is that in perfect good faith we recommended Messrs. Simons' tender.

Q.—I am not suggesting anything against your good faith?

A.—I see I have a note here " I have never seen the contract for dredger "—that is the " Sir George Lloyd "—" and I do not think I knew the total cost plus freights until long after the dredger had arrived at Bombay, and then I had to ask specially for information."

Sir Frederick Hopkinson.—I suggest you ought to have known that—that you could not properly fulfil you duties until you did have that information. How could you supervise it if you did not know what the dredgers were going to cost?

Chairman.—You say that Sir John Biles, as the consulting naval architect, made the final financial arrangements?

Sir Frederick Hopkinson.—No, I think not. I think Sir John Biles had nothing whatever to do with it.

Chairman.—That is what Sir George states.

Witness.—I only make the suggestion. I do not say it was the fact.

Sir Frederick Hopkinson.—We have no evidence that he had anything whatever to do with the financial arrangements.

Chairman.— At all events, Sir George, let us get it right. You say that you did not finally settle, on behalf of the Bombay Government, the price that should be paid for the dredger?

A.—Certainly not.

Q.—Then leave it at that. Never mind who else did it; you did not do it?

A.—I did not do it.

Q.—Nor your firm.

A.—Nor my firm.

Chairman.—Then leave it in that way.

Sir Frederick Hopkinson.—While I am on the question of dredging, there are one or two things I would like to clear up. We have been told that you had weekly reports of the dredging done and the position of the dredgers. Is that true?

A.—Yes, there were weekly reports.

Q.—And the chief engineer, Mr. Elgee, has stated that the scale of bonus which was laid down by you personally made no marked difference in the output?

A.—My recollection is that they did not give the bonus on the lines that we recommended.

Q.—That is Mr. Elgee's statement?

A.—We have no record, but there is correspondence on the subject of the bonus. They proposed a bonus in a certain way, and we protested. We said, " That is not the way to arrange the bonus."

Q.—With regard to the dredger trials, did you attend them?

A.—I did not.

Q.—Did you have your representative there?

A.—Mr. Meik was there personally.

Q.—Did you ever examine the results?

A.—I must have examined them. I did not examine them critically I suppose. After all, Sir John Biles was there, and Mr. Meik.

Q.—Of course the tests were not carried out under anything approaching working conditions, and they have been described as valueless. They gave a percentage of 39 to 41, solid matter, which, as we all know, is absurd, is it not?

A.—I was not present, as I say.

Q.—Your firm were represented there, and you accepted the dredgers, of course in conjunction with Sir John Biles, because, after all, your firm and Sir John Biles were in double harness in the matter. You accepted them?

A.—Sir John Biles was the naval architect and naturally was skilled in these matters.

Q.—But you had equal responsibilitites?

A.—I do not say equal responsibilities. Sir John Biles was the naval architect. We are not naval architects.

Q.—I suggest, further, that Sir John Biles had very little to do with the design of the dredger—that the dredger was designed before September, 1919, in all essential particulars. He may have made slight alterations, but the dredger was designed before you got the price of September, 1919; and it is really Simons' design. It is almost a copy of the "Kalu." The framing is identical. There is really very little designing about it by anybody— that is, original designing?

A.—Well, Sir John Biles might be asked about that.

Q.—You have recognised and your firm have recognised and it has been spoken of over and over again throughout the documents that the dredging is the absolute crux of the whole scheme?

A.—Yes.

Q.—That is so, is it not?

A.—That is so.

Q.—I want to ask you whether you did not think it personally encumbent upon you to be absolutely sure that the trials were certain to ensure success, and that they should have been carried out in the same conditions as they would have to work under in Bombay, including material?

A.—I was quite satisfied with the trials as carried out by Sir John Biles and Mr. Meik.

Q.—But the material in which the dredger was tried is nothing like the Bombay material. It was only passed through the ship, and not delivered 5,000 feet. Those conditions could have been reproduced on the Clyde had it been decided to do so.

A.—We are still going on the assumption that the dredger cannot do the work?

Q.—We are going on the assumption that the dredger never has done the work. It has had three years to prove it.

A.—Then we are going round the old circle that it has not done the work because of the human element.

Q.—I am coming back to my old view, namely, that as you had arranged for the dredger to do 2,000 yards an hour you ought to have stayed on that dredger until you had proved absolutely that it could, or could not, do it.

A.—And I say I am not a dredger master and I have never had any experience in handling dredgers.

Q.—But you are responsible for it?

A.—I am not a dredger master.

Sir Frederick Hopkinson.—But you are responsible for the work of the dredger.

Chairman.—I suppose you would say, Sir George Buchanan, that it having been agreed that there was to be a Clyde test, that the test was carried out on the Clyde with the known material at the bottom of the Clyde, whatever it was, and that it was carried out in accordance with the usual practice?

A.—Yes.

Q.—It may not be a good practice, or it may be a good practice, but the contract being for a Clyde test, the way in which you would put it I suppose is that the test was made in accordance with the ordinary conditions prevailing on the Clyde?

Sir Frederick Hopkinson.—Yes, so far as material is concerned, but not so far as length of delivery is concerned.

Chairman.—Then we get into the other point—whether when you are talking about a Clyde test, in practice they ever put 5,000 feet of pipeline on the Clyde on to the dredger?

A.—No.

Sir Frederick Hopkinson.—But the conditions can be reproduced in another way.

A.—I have had experience in dredging propositions, although I am not a dredging master, and I have been collecting some figures of cost of dredging, which I should like to have an opportunity of putting before you.

Chairman.—You certainly shall have that opportunity. Would you like to do it now?

Sir Frederick Hopkinson.—That is not quite finishing the point. The point is that the ordinary working conditions were not complied with at the trials on the Clyde. It did not pump to any distance at all, and therefore any result they got was valueless.

A.—Well, as the Chairman has said, it was done in accordance with the usage on the Clyde.

Q.—No, no. The usage, so far as the material is concerned, but not so far as the distance is concerned. If you specify for a dredger to deliver 5,000 feet it is a totally different machine from one to deliver into a hopper barge?

A.—Yes.

Q.—The conditions are entirely different.

A.—You could not put 5,000 feet of pipeline out in the Clyde.

Q.—You could put a vertical pipe and reproduce the condition, or you could have put out the 5,000 feet. There is plenty of room on the Clyde?

A.—This is not the only pipeline dredger that has ever been built, and in regard to the numerous dredgers which are built on the Clyde, I take it that the same tests prevail.

Q.—But do not you see that a dredger to deliver into a hopper barge is a totally different machine from one to deliver 5,000 feet, and the tests of the two boats would be entirely different?

A.—Yes. May I respectfully suggest that these questions might appropriately have been put to Mr. MacMurray? I do not know whether they were or not.

Sir Frederick Hopkinson.—We put plenty of questions to him.

Chairman.—This point was put to him, and Mr. MacMurray said it would not have been practicable to have put 5,000 feet of pipe-line on the Clyde, and it was not done.

Witness.—And Sir John Biles?

Chairman.—Sir John Biles's evidence undoubtedly suggests that this trial was carried out in the ordinary way in which trials are carried out on the Clyde.

Sir Frederick Hopkinson.—I want you to realise the difference. A dredger may be designed to pump into a boat alongside, and therefore has not got the extra power required to force it 5,000 feet in a pipe. Therefore it is a totally different thing.

Chairman.—I am only on the difficulty of a contract which specifies trials on the Clyde. Once you have bound yourself to a trial on the Clyde——

Sir Frederick Hopkinson.—You are bound to that material.

Chairman.—You are certainly bound to the Clyde material.

Witness.—Yes, and further I think you are bound, if there is anything like general usage, to have your trial in accordance with that usage.

Sir Frederick Hopkinson.—No. If you specify that it is to deliver 5,000 feet, you cannot say it has fulfilled its trial until it has delivered 5,000 feet.

Chairman.—Or the equivalent as calculated in trials on the Clyde?

Sir Frederick Hopkinson.—That is right.

Chairman.—You and I are not disagreeing on these matters but it is a little out of Sir George Buchanan's range.

Witness.—This is not the first suction pipeline dredger that Simons have built. They have built dozens of dredgers. Either they know their business or they do not.

Sir Frederick Hopkinson.—Was it not their business to get it passed? Was not that their principal business at this time?

A.—No.

Q.—I should say that they did understand their business well?

A.—I do not agree with you because a firm of Simons' standing obviously would not be so short-sighted as to want to get a bad tool passed.

Q.—Well, I would rather not go into that. The fact is that they got it passed without a test of pumping 5,000 feet. Now, in your original report you spoke of having a pontoon for the second station?

A.—Yes.

Q.—Why was that changed to the " Colaba "?

A.—It was changed to the " Colaba " because the electrical people in Bombay, after telling us that we could have electrical power, said we could not, as far as I remember.

Q.—But could not you put a steam plant on a pontoon equally well?

A.—Could we not have put a steam plant on a pontoon?

Chairman.—That is the question.

Sir Frederick Hopkinson.—There is no difficulty about it, is there?

A.—I canont remember now all the points, but I do remember that the intermediate stage dredger was gone into very carefully by Sir John Biles. I think I have got a letter somewhere to that effect.

Q.—The point I want to get at is why did you have a sea-going ship with twin screw propelling engines for your second ship, when all she had to do was to take up her

station on the first day of the season and go back into dock at the end of the season? I suggest it was an unnecessary extravagance?

A.—Well, I should like you to have asked Sir John Biles about that.

Q.—We did?

A.—What did he say?

Q.—You had better read it up in the evidence. I am asking you because I take it that you were chief engineer to the whole scheme, and that nothing of that kind would have been done without consulting you?

A.—As far as I remember I was not consulted at all on that point. As I say the thing was taken over by the India Office. I was consulted on certain special points. They asked me about the details, but I did not give a specific opinion about this, as far as I can remember.

Q.—Can you enlighten us at all about the reason for the great vibration on the " Colaba "?

A.—No. I confess that that is not a matter on which I can give you any information at all. Even Sir John Biles, who is, I suppose, one of the greatest naval architects, said a great deal about it, but I am not a naval architect and I cannot tell you anything about the vibration.

Q.—On the other hand, there is nothing new in a dredger of this kind. There must have been dozens of them built before I should say?

A.—I think Sir John Biles said it had something to do with the working out there. Did you examine Sir John Biles on the subject?

Chairman.—Yes.

Sir Frederick Hopkinson.—But the working out there is simply starting the engine. I do not see how it can be possibly put on the people out there?

A.—At all events, I am sorry. I do not know anything about the vibration.

Chairman.—Sir John Biles seemed to think it was the unevenness of the load, but unevenness of load must happen on every occasion when you are pumping. The question really is whether the " Colaba " was sufficiently structurally stiff.

Sir Frederick Hopkinson.—And moreover whether, if the " Colaba " had been properly tried in this country under the conditions prevailing in Bombay, its structural weakness would not have been found out at the trials; but as far as I can see the trials of the " Colaba " were even more perfunctory than those of the " Sir George Lloyd."

Witness.—Well, I was not present at the trials either of the " Colaba " or the " Sir George Lloyd " and, as I say, I believe there were a number of different opinions about the vibration.

Q.—Whilst on the subject of dredging, can you tell me who decided to send out the dredging crews—who decided that question?

A.—So far as I can remember it was decided in Bombay.

Q.—No, who decided in this country to send them out—who selected the men?

A.—The High Commissioner.

Q.—Advised by you?

A.—With the Board.

Q.—Therefore you would know every man who was sent out to Bombay?

A.—I would not know him personally.

Q.—You would know of every man who was sent out to take charge to work the dredgers?

A.—Certainly, I think we should.

Q.—Consequently you would know as to whether a single or a double or a treble crew had been sent out?

A.—Yes.

Q.—For working single, double or treble shifts?

A.—Yes.

Sir Frederick Hopkinson.—Therefore you would be fully advised in London as to how it was proposed and intended to work the dredgers?

Sir H. Courthope-Munroe.—Do you accept that statement, Sir George?

A.—I accept the statement that we advised.

Chairman.—No, no—that you would know whether one crew or two crews or three crews were being engaged. That is the only question?

A.—I suppose yes, we should know.

Chairman.—The answer to that must be yes.

A.—I do not know that the answer to that question must be yes, because there were a number of men who were engaged in Bombay.

Sir Frederick Hopkinson.—Not dredging masters?
A.—Not dredging masters.

Q.—The subordinates, but not the dredging masters?
A.—Not the actual dredging masters.

Q.—Or the chief engineers?
A.—Or the chief engineers.

Q.—Coming back to another subject, namely, the dredging programme, I have read through all the programmes, and I want to ask you if you can explain some things which appear to me to be very extraordinary. For instance, the first programme of dredging was made on April 25th, 1921, in a letter from you or your firm to Bombay. That is in document 11, page 5. Have you got that?
A.—No, I have not got it.

Chairman.—Let me give you my copy (handing same to witness).

Sir H. Courthope-Munroe.—What document is that, Sir?

Chairman.—It is the big volume of correspondence.

Sir Frederick Hopkinson.—I want you carefully to note the date. It is 25th April, 1921, which was before the dredgers arrived in Bombay?
A.—Yes.

Q.—The programme had apparently been considered, and this was sent out in advance of the dredgers. It says: "In December, 1922, or January, 1923, the 'Sir George Lloyd' alone was to fill up section 1 through pipe-line No. 1, 715,000 cube yards, or one month's dredging. The 'Colaba' therefore was not required"

Chairman.—You might point out that section 1, which has been referred to, is now known as Block 8.

Sir Frederick Hopkinson.—Yes, the small portion at the southern end. Then it jumps to October, 1923—"The dredger to work in area C through pipe-line No. 2 from Arthur Basin, as the length to Marine Lines is very long." That is, it had 10,000 feet of delivery pipe on the harbour side. Then it goes on to say that the "Sir George Lloyd," the "Colaba," and the "Kalu" were to work together. That is presumably on the harbour side?
A.—Yes.

Q.—Can you tell me how that was to be done, and why you wanted three on the harbour side when the distance was only about 5,000 feet, and you had 10,000 feet on the other side?
A.—Really, Sir Frederick, I cannot go into this. This is a suggested programme made in 1921.

Q.—But I want to see why the "Kalu" is introduced into this, because there was no more to be done at this time than was originally contemplated?
A.—Well, I cannot answer these questions. This is a proposed programme of operations, subject to discussion. There it is.

Q.—But this is a programme given by you, the Chief Engineer of the works, to be carried out. I want to know why you want three dredgers on the harbour side?
A.—"The following is the proposed programme of operations."

Q.—You suggest that the "Kalu" should begin work in October, 1923, but actually she was not fit to work until July, 1924?
A.—No, for a very excellent reason.

Q.—That she had not been repaired?
A.—That she had not been repaired.

Q.—Did not you know this when you made this programme of April, 1921?
A.—That the "Kalu" had not been repaired?

Q.—Yes?
A.—I take it that I supposed that the "Kalu" would be in working order by that time. I had nothing to do with the repairs of the "Kalu."

Q.—Did not you do anything to make sure that she would be in working order at the time?
A.—I had nothing to do with the "Kalu." I do not even know what the repairs cost. I had no hand in the surveys. There is a letter on record, I remember, in which I wrote to the Director of Development impressing upon him to speed up with any repairs necessary to the "Kalu."

Q.—I think that was towards the end of 1923. I am speaking of a programme made in April, 1921. You are sending out a programme for a machine to work which could not possibly work?

A.—I do not see why I should assume that the " Kalu " required all these repairs. We sent out, to the best of our ability, a programme of operations for consideration. As a matter of fact, that programme was not carried out at all. We sent out programmes, but we had no power to carry out those programmes. We sent out suggestions. We were full of suggestions, but we had no power to tell the Chief Engineer to hurry up with the repairs to the " Kalu," or to do this, or to do that.

Q.—My suggestion is that it was never necessary or desirable to put three dredgers working in series on the harbour side? There was no room for them to work. They could not work there.

A.—I should not like to agree or disagree with you without consideration. As I say, it is a very long time ago. As a matter of fact, this programme was not carried out.

Sir Frederick Hopkinson.—I am afraid that applies to practically all the programmes.

Chairman.—Can you, even now, looking at the map in front of you, suggest how those three could have been worked conveniently and economically together? Does it occur to you now how it could be done? We have all the plans and everything here?

A.—I could not say off-hand, Mr. Chairman, but if I went to my office I could produce a plan showing the three working. As a matter of fact, it never materialised.

Sir Frederick Hopkinson.—There was no alteration between then, 1921 and 1919. The work remained the same, and in 1919 the work was to be done by two boats. It is only more or less of an accident that you have the " Kalu " there. She is not a part of your operations for completing the work in six years?

A.—No.

Q.—Then it goes on to say that you hope to finish section 2 in one season—5,700,000 cubic yards. Of course, we know she never did more than one-fifth of that.

A.—Well, it was a very good thing to be optimistic, and to express a hope.

Q.—You think it was?

A.—I do.

Q.—Then in October, 1924, there is another programme, area No. 3, to be begun. Area No. 3 is the Marine Lines end. That was to be begun from H.J. and K.—that is here? (*indicating on map.*)

A.—Yes.

Q.—We know it was physically impossible to do that?

A.—You see, all these programmes were altered when the Development Directorate discovered, as they thought they had, the material in Back Bay itself.

Q.—But this is October, 1924?

A.—Yes, October, 1924. This is the suggested programme made in 1921.

Q.—No, this is a new programme made in October, 1924.

A.—I have not got that. What page is that?

Q.—It follows on in that book.

A.—Yes, it is all under the same letter of the 25th April, 1921.

Sir Frederick Hopkinson.—No, this is October, 1924.

Chairman.—Will you turn back to page 5. It is a forecast looking ahead from 1921 onwards?

A.—Yes. In 1921 one makes a suggested programme for five years' work, but in a work of this magnitude questions arise every few months. You must have something to start upon.

Sir Frederick Hopkinson.—There, again, your optimism is just as strong as ever. You are going to do 6,387,000 in one season of 1924-25 and a portion of 1925-26?

A.—Yes.

Q.—Section 4 was 3,500 feet away from the end of the pipe. Then we come to the programme of 3rd May, 1923, in which the " Kalu " and the " Colaba " are to be working together in Back Bay?

A.—Yes.

Q.—And the " Sir George Lloyd " alone in the harbour?

A.—Yes.

Q.—Was anything done to prepare for the " Colaba " working in Back Bay?

A.—Which page is that?

Q.—That is 3rd May, 1923, page 84. The third paragraph in the letter says: " With regard to the general dredging programme, we have prepared a scheme on the assumption that an effort will be made to put both dredgers in commission after the coming south-west monsoon." That would be December, 1923?

A.—Yes.

Q.—They were only to make an effort to get them ready?

A.—Well, if you ask people to make an effort——

Q.—This is on the assumption that an effort will be made. Where was the "Colaba" to work, and how was she to work, because so far we have only had a reference to a hole being dug to float the "Kalu"? Will you turn to page 100. This is the 3rd November, 1923. You write to the Director of Development and you say in the first paragraph: "It appears to us that it will assist the administration to have before them even a tentative programme of operations".

A.—Yes.

Q.—So that, as far as we have got at that time, it is a tentative programme?

A.—Yes.

Q.—On page 101 you say that it will be possible to complete the dredging in the year 1926-27?

A.—Yes.

Q.—I want to suggest to you that these programmes are absolutely futile and have no solid foundation of any kind whatever. Then on page 101 is the first statement about the "Kalu". This is the 3rd November, 1923. "I also recommend that very early action be taken in putting the dredger "Kalu" into working order and arrange for any additional pipeline and a terminal pontoon, if such are required."

A.—Yes.

Q.—That is the beginning of that season, November, and therefore nothing whatever could have been done by the "Kalu," nor could you have had those additional pipelines until the end of the season, and that is throwing it all forward to 1924?

A.—Where is that?

Chairman.—That is Page 101, the last paragraph but one: "I also recommend that very early action be taken in putting the dredger 'Kalu' into working order." She was bought in November, 1919, was she not? "And arrange for any additional pipeline and a terminal pontoon if such are required." Sir Frederick's question is: Having regard to the fact that that letter was written in November, 1923, did not that mean that the "Kalu" must have been out of commission the whole of that season—November to March or May; and also could not do any more work until the following October or November, 1924? That seems to be so, does it not?

A.—Yes. It states in this letter: "I recommend that very early action be taken in putting the dredger 'Kalu' into working order." That is not to say that I for my part had forgotten the existence of the "Kalu"; it does not mean to say that every year I was out there I had not spoken about the "Kalu."

Sir Frederick Hopkinson.—But had you?

A.—Yes, I had.

Q.—Well, there is no suggestion here that they have not been carrying out your wishes. It comes as a new thing. "I also recommend"—as if it were something fresh.

A.—I do very distinctly remember that I was constantly pressing upon them to do something to the "Kalu".

Q.—Did they ever give a reason why they did not do it?

A.—No. The reason was that Mr. Lewis did not seem inclined to do it.

Sir Frederick Hopkinson.—Now I want you to look at the bottom of Page 103 where Mr. Lewis makes a statement. I do not know to whom it is made; it is simply dated 21st November, 1923.

Chairman.—It is evidently a memorandum to the Director of Development.

Sir Frederick Hopkinson.—He says: "I would point out that we are by no means sure that the filling from the harbour is going to be of use as a means of reclaiming the area". Surely that was a very alarming statement, was it not, made in November, 1923, as to whether the whole scheme was not going to be valueless as originally proposed?

A.—This is a note, I think, to the Director of Development. I saw it for the first time the other day. I do not think I have seen it before. We are back on the old subject which I emphasised in my statement, that Mr. Lewis got very pessimistic about the drying out qualities of the material in the harbour. This is November, 1923, and it was about this time——

Q.—Just before the dredger was to start?

A.—Yes.

Q.—My question is, is not that a very disturbing statement to make at this period?

A.—Yes, if you do not know all the circumstances.

Q.—But even if you do know all the circumstances, it is disturbing as a statement from the chief engineer—a man who was responsible out there for the carrying on of the work. He did not know that the material, which you had spent three-quarters of a million in providing dredging plant for, was going to be any use for the purpose intended?

A.—I think you examined Mr. Lewis about this, did you not?

Chairman.—It must be disturbing one way or the other. It is extremely disturbing if Mr. Lewis is right that the material is unsuitable, and it is extremely disturbing if Mr. Lewis is wrong, because he is your chief engineer. It is disturbing either way?

A —Yes.

Sir H. Courthope-Munroe.—Might I suggest that he was " the " chief engineer and not " your " chief engineer?

Chairman.—The chief engineer.

Sir Frederick Hopkinson.—He was the resident engineer, and his title was altered.

Sir H. Courthope-Munroe.—But it is " the " and not " your ".

Sir Frederick Hopkinson.—He was the resident engineer and then his title was altered, but his work was not altered?

A.—Mr. Lewis was obsessed with the idea, as I have already said in my statement that he could get the whole of the material from Back Bay.

Sir Frederick Hopkinson.—He has given a specific quantity. He said he found 24,000,000 or 25,000,000 yards, did he not?

A.—Yes, and at Page 106 of my statement I quote a letter to Sir Lawless Hepper in which I say : " In the matter of dredging it seems to me that for some reason of his own Lewis has made up his mind to delay operations as long as possible and to begin reclamation at Marine Lines instead of at Colaba." Later on we had to protest and say that we could not agree with his proposal that the whole of the material should be obtained from Back Bay. It was a complete reversal of the whole programme. He was obsessed with that idea.

Q.—But having seen that mud here in this room, do not you think there is something to be said for Mr. Lewis' point of view? Was not it sufficient to disturb him to think that that was the material he was going to get for making a reclamation which was to be finished and developed in 1928? Do not you think he was justified in fearing that it could not possibly be done?

A.—Subsequent to his writing on that date he got a lot of that identical mud and put it into an enclosed area, and it did dry out, and he was very pleased with it.

Q.—You remember when I asked you the question as to whether you had known that was the kind of material before you advised the Bombay Government, you hesitated a good deal before you said it would not alter your opinion—and I think very properly so, too, if I may say so. I cannot conceive much worse material for reclamation purposes?

A.—Yet we can produce examples from different parts of the world where quite as bad material has been used.

Q.—A great deal depends on what you are going to use the reclamation for. If you are going to make streets and to build houses on it, I should think you could not have anything possibly worse?

A.—The advantage of that reclamation is that the foundation is all rock.

Q.—Yes, when you get down to it?

A.—Yes, when you get down to it.

Q.—But you have got to get down to it?

A.—Yes, you have got to get down to it.

Q.—Besides, you do not know that it is all rock anywhere near the surface, any short distance from the shore. There are no borings or anything to show that. On page 104 Mr. Lewis was equally confident that the dredging was going to be finished by 1927. He is still going on that arithmetical computation of yours, that the dredger was going to work so many days a year and so much an hour, and therefore it would do 5,000,000 cubic yards in a year. He goes on to say : " This will be incorrect probably as to area (7) and would have to be altered as experience is gained; but it is as accurate as any other forecasts."

A.—Yes.

Q.—I think Mr. Lewis did see occasionally. Then on page 114, in May, 1924, Mr. Lewis is writing for a lot more plant for the dredging programme?

A.—Yes.

Q.—He suggests the purchase of the " Jinga " because it had got a bad hull. So far as I can understand, he proposed to take the engines out of the " Jinga," scrap the hull, and put them on a pontoon, or something of that kind?

A.—Yes.

Q.—And buy a barge for an independent pumping station. This makes four dredgers against two contemplated in 1919?

A.—Yes; but might I just make a remark? I would like to point out that there are a number of comments to make, especially on this one dated the 10th December, 1923.

Chairman.—What is the page?

A.—104. I should like it noted there that the chief engineer corresponded freely with his chief, the Director of Development, as he should do; but we never saw any of this correspondence. Perhaps there is no reason why we should. He was the chief engineer and the Director of Development was his chief; but we never had any copies of this correspondence sent to us.

Sir Frederick Hopkinson.—On 7th May, 1924, we come to another dredging programme of yours in which you propose that the " Kalu " and the " Colaba " work together in Back Bay, and the " Lloyd " works alone in the harbour. That means that the " Lloyd," working alone, could only reach 5,000 feet from the point where dredging was taken until its final point in the reclamation. Therefore its work would be very limited?

A.—Yes.

Q.—Then you come to another one on page 117, on 5th June, 1924, whereby the " Kalu " was to dredge flotation in Back Bay, and on page 118, the " Kalu," the " Colaba," and the " Lloyd " were to do long-distance pumping. I cannot reconcile the two at all.

A.—These were all different programmes got out to assist the Development Directorate as the situation developed.

Q.—Then on the same page, 118, there is a suggestion from your firm of an entirely new development, namely, that of an electrical pump. Where was that to be put? This on the 2nd May, 1924.

A.—Yes.

Q.—If you were going in for a new electrical pump, that would have meant you could not have used it for 18 months. That is taking you into December, 1925. Could you tell us what the electric pump was for?

A.—Why do you say that?

Q.—A big thing like that cannot be bought off a shelf. You have got to get it made. They do not exist.

A.—We suggested that he should investigate the possibility.

Q.—What is it for? What has it to do? Where is it to work?

A.—It was on the supposition, according to all these borings, that there was all this material in Back Bay.

Q.—Where was this to work? Was it for Back Bay, or was it for the harbour?

A.—Obviously, to work in Back Bay.

Q.—The electrical pump?

A.—Obviously.

Q.—Where was it going to be put?

A.—Obviously, it was to be used in conjuction with the " Kalu " in Back Bay on the supposition that there was all this wonderful material there.

Sir Frederick Hopkinson.—But there is nothing to suggest that it was going to work with the " Kalu " at all.

Chairman.—I think, if you look at it, it says: " We agree with you that for use with the ' Kalu ' a second intermediate pumping station is desirable." That is what was being discussed?

A.—That is what was being discussed.

Q.—It had been mentioned before, and Mr. Lewis had put forward the purchase of the " Jinga " : " We note your remarks as to the proposed purchase of the ' Jinga.' " That would be as a second intermediate station, would not it?

A.—Yes.

Q.—" But we suggest that before taking any action in this respect you should investigate the possibility of using an electrically working pump." That was the alternative to buying the " Jinga "?

A.—Yes; that was the suggestion. I see that on the 12th June, 1924, again trying to keep a curb on the expenditure, I wrote to Sir Lawless Hepper and said: " I may say we have given the whole subject prolonged consideration, and we cannot understand why Brims requires the enormous quantities of pipes for which he has indented."

Q.—Is that in the print?

A.—No; this is a letter of which I do not think you have a copy.

Q.—There is a letter very similar to it at pages 126 and 127.

A.—Yes. In the same letter I say: " The diagram showing the method of filling the military area sent us by the letter dated the 28th April, 1924, is to us quite inexplicable."

Sir Frederick Hopkinson.—Whereabouts is that?

A.—That is a letter which is not in the book of correspondence. It is really a question of one party making orders and having no power to tell the other party what they are to do.

Q.—This is just a casual remark about the electric pump. Then there is another letter which follows suggesting that you are going to generate your own electricity by Diesel engines. That is another new phase. That is page 130: "We are disposed to think that if you cannot get electricity from the Tata Supply Company it will be quite worth while to have a small electrical installation of your own worked by Diesel or semi-Diesel engines." There we are getting to July, 1924. That could not possibly be available until October or November, 1925.

A.—I would not say that; but that, again, is a suggestion for them to consider. We did not dictate.

Chairman.—At page 127 you say: "In any case, you will not require the second intermediate pumping station for the coming season's work."—

A.—Yes.

Chairman.—So that you did not recognise this plant could not be got out until, as Sir Frederick Hopkinson says, October, 1926?

Sir Frederick Hopkinson.—To continue the correspondence: at the bottom of page 130 you telegraphed to them that you are "anxious about dredging. Have you made arrangements regarding engagement of complete staff for working double shift on all dredgers?"

A.—Yes.

Q.—You knew exactly what arrangements had been made because you had sent all the men out from England. I suggest it was for you to say you are to work double shift, or treble shift, whichever you like; and therefore so many men will be necessary, and saying how many men will be necessary, and that you would arrange to send them out?

A.—There I must dissent absolutely. My firm had no authority whatsoever to say to the Development Directorate: "You have got to do this," or "You have got to do that." "You have to work one shift," or "You have got to work two shifts."

Q.—We must carry this a little further. You have the responsibility for completing the work in five years. One of the essentials for doing that is that your dredger should be working 24 hours a day, is not it? Is there any correspondence in which you told the Development Directorate that until they worked the dredger 24 hours a day, 15 hours' pumping time, the scheme could not be carried out?

A.—Well, it was obvious without putting it in the correspondence.

Q.—You are involved in this because you have given the Government an estimate for doing it in five years?

A.—Yes; but I am not responsbile for the carrying out of the work. I say that I had no responsibility for the expenditure, and I had no responsibility if the Government chose to be dilatory. I put in a letter the other day from Mr. Lewis in which he, as chief engineer, says he had written four letters to the Government and had asked for sanction to engage the additional dredging staff. He said: "Here you are. I have written four letters. I cannot get any reply. What am I going to do?" You cannot force a Government to do things—at least I cannot.

Q.—Will you turn to page 131? We come to another thing then. This is a letter from Mr. Elgee to you in which he speaks of two booster pumps being required. That is making a new pump. That is August, 1924. Does not this boil down to the fact that nobody, either in London or in Bombay, had anything but the very faintest ideas of how they were ever going to do the work?

A.—No; I do not agree.

Q.—We have had all these variations, and now we come to another one in August, 1924—two booster sets in addition to the three you have already got.

A.—No.

Q.—You have got three floating ones?

A.—We are talking about booster pumps.

Q.—There are three floating ones and one electrical one, and now another one. There are the "Kalu," the "Colaba," and the "Sir George Lloyd"—that is three.

A.—Those are not booster pumps.

Q.—They are not; but those are three, two of which were going to do the entire work. You have got three, and now you have the "Jinga," a floating booster, or electrical booster—I do not know which—and now you come to another booster, which makes two booster pumps. That is five pumps to do the work of two.

A.—I cannot be responsible for this letter. Mr. Elgee says that he thinks two boosters will be required, but I do not think that I am responsible for that.

Chairman.—The only point of the letter is this. Sir Frederick Hopkinson puts it to you : Does this letter of the 8th August, 1924, with all this backing and filling, and so on, show that nobody really had any set deliberate plan, even at this date of August, 1924? That is the only question you are asked.

A.—There were plenty of definite plans. Let me put to you a case, viewing the matter in another way. The original programme for dredging was in the harbour—in very suitable material. Then, due to the action of the Port Trust, we had to look about for new area, and we propose to go further out into the harbour, involving more pipe line. Then the chief engineer and the Director of Development initiated the programme for Back Bay. That involved another dredging operation in Back Bay as well as dredging operations in the harbour. If you go from step to step you can see how the various programmes have been worked out. We did not initiate Back Bay. We did not approve of Back Bay. Now that the borings have turned out to be erroneous it seems a pity they ever went to Back Bay; but the chief engineer was obsessed with the idea that he would get an enormous amount of material from Back Bay. That is how these various programmes originated. First of all the Port Trust and the Indian Marine took away a large area. Then we made other arrangements, and then the Development Directorate, on their initiative said : " Let us go to Back Bay." You can follow the thing through, and I dissent entirely from the suggestion that we are a set of fools, the whole lot of us, and we never had any programme at all, and we did not know what we were doing. We gave the matter very serious consideration.

Sir Frederick Hopkinson.—Answering one or two of the things you have said, it is true the Indian Marine took away a certain area up here (*pointing on the plan*)?

A.—Yes.

Q.—But that is from 75,000,000. They still left you with more than you wanted. Moreover, all you had to do was to come out here to get it nearer than that, so that you had no limitation of material at all, but you had ample material without going to Back Bay at all. The reason you went to Back Bay is the very obvious one, that it was physically impossible to do the reclamation with the plant you had provided. It had not power enough?

A.—No, I do not subscribe to that idea at all. It is perfectly true that there was material available, but in another position.

Q.—Equally convenient or more convenient?

A.—I do not think so.

Q.—It is a matter of measuring it off. It does not involve more pipe-line, it involves less pipe-line. Now what about these erroneous borings? You have said several times that the borings in Back Bay are erroneous, but that is the only statement that has been made by anybody about their being inaccurate. So far as we know, they are perfectly accurate. They give you the depth of the moorum or rock in a very large number of places?

A.—Well, I think we have reason to suspect that a lot of them never were taken at all.

Q.—No wonder the Back Bay scheme is where it is.

A.—We did not take them. We had nothing to do with the taking of them. I notice, if I may interpose a word, that at page 133 there is a letter of the 18th September, 1924, which shows the way in which the dredging masters were selected. It is a letter from the Secretary to the High Commissioner for India in London to the Secretary to the Government of Bombay.

Q.—They ought to have been out there then for that season's work.

A.—But see the routine, and you see the difficulty in getting the people. The Governor of Bombay sends a telegram to the High Commissioner for India, asking whether, in consultation with Messrs. Meik & Buchanan, certain dredging masters may be appointed. Then there is a Selection Committee on the dredging masters, and the terms of engagement, the salaries and allowances, and so on, were made by the Government of Bombay entirely without reference to us.

Q.—You mentioned this the other day, and I said that all this was done on your recommendation, the Committee though appointed did not know the difference between, a dredging master and an engineer, and they would be taken on your recommendation.

A.- On their terms.

Q.—You agreed to it?

A.—We did not agreed to the terms. We had the terms put before us.

Q.—It was on your recommendation of the men?

A.—Yes.

Q.—The terms did not matter, because the terms were acceptable to the men, or they would not have gone?

A.—Naturally you can get very much better men at higher pay than you can get at lower pay.

Q.—That question has not arisen. Then on page 139, in a letter from yourselves to the Chief Engineer, you say: " You have no doubt been able to form a definite opinion as to the cause or causes of the low output, and we shall be glad, therefore, if you will let us have all information on the matter, so that we can consider it before taking up the matter with the builders." That is because the dredger was only giving 43 per cent. of the specified output?

A.—Yes.

Q.—This is February, 1925. Did you take it up with the builders?

A.—Well, in February, 1925, as a matter of fact, I thought I was going to die.

Q.—Not February—that was August.

A.—No.

Q.—August, 1925.

A.—No.

Q.—In February, 1925, you were on your way to Australia, and were having an ideal sea trip, I have no doubt?

A.—Yes.

Chairman.—This is Mr. Halcrow's letter from London?

A.—Yes, this is Mr. Halcrow's letter. He is a member of the firm. I think you might have asked him about that.

Sir Frederick Hopkinson.—Have you ever heard that he ever took it up with the builders, and with what result, because we have not seen any result?

A.—I will refer to that and see what was done.

Q.—Have you heard that anything resulted from taking it up with the builders—if anything serious was done? If anything of consequence had resulted, you surely would have heard of it?

A.—My impression is that the builders said: " You have got the dredgers and you have got the tests. We are not working the dredgers, and that is all about it."

Q.—You think that is all the builders would say?

A. I think that is all the builders would say.

Q.—But did they? Evidently Mr. Halcrow was under the impression that he was going to get some satisfaction from the builders, or was going to try to get some satisfaction?

A.—Well, what he actually did I will investigate.

Chairman.—What, in fact, happened was that the firm of Messrs. Meik and Buchanan said they had several conversations with the builders, and neither your firm nor the builders could understand why the dredger was not giving its output. I am sure that is somewhere here.

A.—I think I remember something of that kind. There is a letter of the 15th October, 1925, at page 166. Is not that it?

Q.—I am sure there is a passage somewhere making that statement, that neither the builders nor yourselves could understand it.

A.—Here it is at page 166: " The builders are naturally, for their own sakes, anxious that the plant should prove a success, but they are not specialists in the handling and working of dredging plant, and in the absence of any specific complaint about the machinery or any portion of same, it is not clear what good interest could be served by their representative going to Bombay."

Chairman.—That is not the letter. Here it is, page 158: " Since the beginning of the year, we have had several conversations with the builders on the subject, and are in further communication with the Chief Engineer." This is a letter from Messrs. Meik and Buchanan of 25th May, 1925. Then: " Neither we nor the builders can understand why any estimate should be based on a figure which is less than one-and-a-half of the designed output of the ' Sir George Lloyd,' more especially as the less powerful vessels 'Jinga ' and ' Kalu ' pumped much larger quantities over long periods when working on the Sewri reclamation." That shows the conversation, and I believe there is another reference to it. The conversations with the builders evidently would mean with Mr. McMurray.

Sir Frederick Hopkinson.—Yes. I think you told us that early in 1922 Mr. Brims was in London, and you then told him that the dredger was to be double shifted?

A.—Yes.

Q.—But so far as I have seen, there is no other reference in any of the correspondence about this. When the dredger started the first year you single-shifted. I

do not see any letter of complaint from London saying : " Why are you only working single shifted? "

A.—We do not put every complaint in writing.

Q.—But this is a very, very important one—it is a very serious matter, is not it, because it is prejudicing the entire completion of the work?

A.—Yes.

Q.—It is one of the most important things. I just wanted you to tell us if there had been any other reference to it, because I do not remember any.

A.—I do not remember any written reference. As I told you, Mr. Brims went out with orders to work two shifts.

Q.—But you say you had no power to give him orders?

A.—Very well; with the suggestion or hope that he would work two shifts.

Q.—Do you mind looking at page 152, the document dated the 8th April, 1925? The chaos about these dredging programmes apparently leads them to consider the proposal to carry out earth filling simultaneously with dredging operations?

A.—Yes.

Q.—Which seems to be a recognition that the dredgers have failed?

A.—Yes; and later on we scouted the idea, in reply to that letter, and told them to work their dredgers properly.

Q.—Would you mind turning to page 65, paragraph 3 : " Assuming that the dredger ' Sir George Lloyd ' commences to pump from the Harbour to Colaba next November, Sir George wished if possible "—that is you—" that the dredger ' Kalu ' should commence about the same time to pump from Back Bay to Marine Lines. Mr. Lewis said he thought it better to use both dredgers at Colaba, as the land there was of more value to the Development Directorate. That was admitted, but Sir George said that Sir Lawless Hepper agreed with him that it would have considerable moral effect on the whole scheme to complete a section at Marine Lines as soon as possible "?

A.—Yes.

Q.—What does that mean " moral effect "? Why was it to have a moral effect?

A.—Well, I remember that. Sir Lawless Hepper and the Government of Bombay were always anxious that there should be something to show to the people to enamour them of the scheme. Sir Lawless Hepper and I were discussing it, and, as put there, it would have a considerable moral effect—I do not mean by " moral effect " anything to do with public morals, but, to put it in another way, it meant this.

Chairman.—You mean it would be heartening for the people to see considerable progress being made?

A.—It would be heartening for people to see something going on. When we started working at Marine Lines, I know the Government of Bombay was most anxious that work on the gantry should go on, so that everyone driving in the morning should see the work going on, and be heartened, as the Chairman puts it.

Sir Frederick Hopkinson.—" What a wonderful scheme we have going on; we can see it growing day by day."

A.—Yes.

Q.—That is your idea; but do not you think the best moral effect would have been produced by the dredger delivering 2,000 yards an hour?

A.—The people would not have seen that.

Q.—But it has a pretty heavy effect—2,000 yards an hour.

A.—I do not despair of hearing that the dredgers are doing 2,000 yards an hour, if they are given a proper show.

Q.—I would like to lay a little stress on your calculations in your original report, about the daily output of the dredger. Was it your intention that the dredger was to work 24 hours a day, of which 15 hours would be actual pumping?

A.—My idea was that it would pump for 15 hours a day.

Q.—How long would that necessitate the men working?

A.—That would depend on the circumstances, rather. We certainly did not contemplate them going off for meal-times. We contemplated a 15-hours day.

Q.—Fifteen pumping hours?

A.—Yes.

Q.—I still do not understand how you expected to do that in this first season, when you had only one dredging master. The whole thing was laid on the shoulders of one man. If he had fallen sick, your dredger could not work.

A.—Well, you are quoting my own words, Sir Frederick Hopkinson. What did I do? I go to Bombay and I see one dredging master doing the work, and I say : " Good God, look at this; if this man falls sick, your dredging must stop."

Q.—I should have thought you would have said: "Good God, why did not I send out some more dredging masters?"

A.—Must I repeat again that I had no more power to send out dredging masters than you had power to send out dredging masters?

Q.—So far as I can see in any of the correspondence, there were no orders or instructions that 15 pumping hours per day must be worked, in order to carry out the proposed scheme; but you say over and over again that the dredging is the crux of the whole scheme, yet there is no instance anywhere, in any of the correspondence or instructions, that the dredger must work 15 pumping hours per day. Do you agree with that?

A.—Well, I cannot see anything of the kind, but we get up to the old story that without control there was no possibility of making them work 15 hours.

Q.—Then I would like to call your attention to the fact that on 15th December, 1924, you wrote: "The Dredging Department have done all that is humanly possible to get on with the work"?

A.—Yes.

Q.—What does that mean?

A.—I remember that.

Q.—What does it mean?

A.—Well, the individuals.

Q.—No. This is the Dredging Department, not the individuals.

A.—Very well. Take the Dredging Department. Mr. Brims is the head of the Dredging Department; and there had been a lot of difficulties when I was out there. I reported them in my report. There had been difficulties here, and there had been difficulties there; and so far as I could see the Dredging Department, that is to say, Mr. Brims and his staff, had done all that they could to overcome those difficulties. I described those difficulties in detail. They had done all that was humanly possible. I wanted them to realise that I thought they had done all that they could to overcome those difficulties. That is nothing to do with the difficulties of the Government.

Q.—I am dealing with the dredging only.

A.—And the difficulties of getting the men and working 24 hours, and all that part of the thing. That is the explanation of that.

Q.—How do you square that with an accusation that the dredgers have been mishandled?

A.—Well, that comes later on. The dredgers had been mishandled. I call it mishandling the dredgers when they only work for a few hours a day.

Q.—Well, they always worked a single shift the first year, the year you spoke of as the experimental pumping?

A.—I can only say: "Free the work of Government control. Do not let the senior officers' time be taken up writing forms in their office. Give them a free hand to push the work on; but first of all, take it out of Government control."

Q.—That is a thing the Government will consider. I suggested to you the other day that the order of priority for doing the work in your report was not right. The dredger actually began working in December, 1923. If that dredger had been provided in September, 1921, the price of ship-plates at that time was £14 a ton, but at the date the dredger was ordered, they were £24 a ton, which is very nearly double. I suggest to you that had you postponed the purchase of the dredger for 18 months, you would still have been in ample time to do the dredging work, and have got your plant at a little more than half the price you paid for it?

A.—It is always easy to be wise after the event.

Q.—I suggest to you that every day wise people are wise before the event?

A.—Some people are and some people are not. If you look at things to-day, and how things have happened since, naturally you would say: "Yes, we should have saved money if we had bought the dredgers a year later than we did." But when we bought the dredgers it was on a different programme altogether. We hoped that the works would be pushed forward much faster than they were, and that the dredging would begin sooner, much sooner, than it did, and so on, and so on, and so on. According to our lights, we recommended what at that time we thought to be the best.

Q.—The contract time for building the dredger was 14 months?

A.—Yes.

Q.—If you had ordered the dredger and began the works at the same time it would have been different, but actually you did not begin your preparatory works in ordering the plant until about September, 1920, and therefore the dredger which had then been ordered six months would be half built. You had to decide on the method of doing the work, you had to decide on what plant you were going to use; you were going to

order that plant and have it made specially; you were going to get it to Bombay; you were going to open up the quarry and fix all this plant. That left you with only about eight months to do all those things. It is a physical impossibility. You ought to have had at least 18 months for that—18 months to two years.

A.—The original proposal was to let the contract in October, 1920. The contract was actually let in October, 1920, and it was then cancelled because the Governor in Council had decided to do the work departmentally. I was in London, and the dredger had been ordered when we got the intimation that the programme had been changed and that the Governor in Council had decided not to go on with the contract. As regards arranging for the quarry, we had nothing to do with arranging for the quarry; that was entirely done by the Development Directorate.

Q.—It was not the actual arranging I am speaking of, but it was the provision of the time for doing the work. That you were controlling—do not forget that—because you ordered the dredger. You made the programme. You were laying down the programme. All the machinery was designed or arranged for in your office by Mr. Lewis and Mr. Meik.

A.—By Mr. Lewis.

Q.—And Mr. Meik, because Mr. Lewis told us that Mr. Meik overrode him.

A.—Overrode him?

Q.—Yes, about the gantry, for instance?

A.—Well, I should like to read Mr. Lewis's evidence.

Q.—He said Mr. Meik said how the work was to be done.

A.—Mr. Meik certainly did not order the plant.

Q.—He did not actually order it, but he decided what plant was to be ordered?

A.—No, I disagree, because Mr. Lewis came home specially to order the machinery for the quarries. He had a free hand in ordering the machinery for the quarries. He knew everything that was wanted for the quarries, and he came home. He saw Sir Lawless Hepper when he was at home, and he ordered the machinery.

Q.—Actually he told us that Mr. Meik was advised by a contractor in London not to build that gantry, but he insisted upon doing it because he said it would be more convenient. That is what Mr. Lewis told us.

A.—Yes; that is talking about the gantry, but I mean the general arrangement.

Q.—That is one of the proposed arrangements?

A.—Yes.

Q.—In your report of 15th December, 1924, stating the reason for the alteration of programme, you say: "The proposed pipe-line involves such an immense amount of costly and difficult work that all idea of a pipe-line in that vicinity should be abandoned." That existed in 1919, did not it?

A.—That existed in 1919.

Q.—And should have been foreseen?

A.—No. Mr. Kidd investigated it for this pipe-line, and Mr. Kidd never considered——

Q.—We are dealing with your pipe-lines—we are not dealing with Mr. Kidd's pipe-lines—which run along Ormiston Road. I say that should have been seen early in 1919. Now I am coming to rather an important point in connection with the dredging, and that is this: You calculated getting 2,000 yards an hour for 15 hours a day?

A.—Yes.

Q.—That would be under average conditions—an average output for those 15 hours?

A.—Yes.

Q.—I suggest to you that a prudent and experienced man would provide that the dredger's maximum output on trial should be nearly double that in order to get 2,000 yards average?

A.—Well, that is a matter of opinion. You get a reputable firm of builders who give you a plant which they say will give 2,000 cubic yards for 15 hours.

Q.—On trial; but they did not say in their tender it would do it as an average?

A.—There again these are not the only dredgers these people have made.

Q.—We are dealing with this particular dredger, and do not let us get away from it. They contracted to give you a dredger to deliver at the rate of 2,000 cubic yards an hour on trial, and they say they have fulfilled that condition, and the marine architect has agreed with that?

A.—Yes.

Q.—My suggestion is that a prudent and experienced man, a man who knew of all the delays likely to arise in connection with dredging, would provide that the maximum output should be nearly double the average output?

A.—Well, that is entirely a matter of opinion. If you had had a dredger that dredged 4,000 cubic yards an hour under the conditions that prevailed in Bombay, you would not have got the output.

Q.—That is not my point.

A.—Under the conditions which prevailed in Bombay.

Q.—That is not my point at all. A machine designed to give an average output should be designed to give a much greater test output for a short period. It is not a question of opinion; it is a question of ordinary daily common sense and experience.

A.—Well, you have your opinion on that, but I should like to have evidence on that. Let us see what has been done.

Q.—Can you tell me any machine doing such work as a dredger that is going to work at 100 per cent. efficiency for 15 hours at a time?

A.—Not 100 per cent. efficiency for 15 hours at a time, but 15 hours out of 24.

Q.—Well, 15 hours out of 24 at 100 per cent. efficiency at each hour; that is what it has to do. You are reckoning on it working 15 hours?

A.—Yes.

Q.—I suggest to you that it really is absurd to expect a machine to do that?

A.—Well, I cannot agree with you, and I think if you search among the records there are of dredging plants you will find it has been done.

Q.—That what has been done?

A.—A dredger has done it.

Q.—That is, its test output is taken as its average output?

A.—No; that a dredger of this kind, capable of delivering soft clay a distance of 5,000 feet at a rate of 2,000 cubic yards per hour—I think the records will show you that it has been done for continuous periods.

Q.—You think so. How about the "Kalu" and "Jinga"? Is not that a case in point that was prominent before your eyes? They fulfil their test out there, but their average load was only about 50 or 60 per cent.

A.—Yes.

The Chairman.—1,126 was the average.

Sir Frederick Hopkinson.—A little over 50 per cent.—is not that an illustration?

A.—I do not think it is. I would like to say a word about the "Jinga" and "Kalu." I said to the Chairman the other day that I had not seen Mr. Messent's note. As a matter of fact I had forgotten the particular note, but two or three days ago when I was looking over my records I came across the copy which obviously had been given to me by Mr. Messent, because it had his own signature upon it. Well, I read the note through very carefully naturally, but I cannot find in Mr. Messent's note anything condemnatory of the dredgers, obviously when you read this report it is plain the work was done in a leisurely manner—there was no particular hurry. But there is nothing in Mr. Messent's note to say that he is dissatisfied. He puts on paper a plain record, and there is nothing to show he is dissatisfied. I was reading Lord Lloyd's evidence the other day, and I read what he said about the Sewri reclamation works.

Q.—I entirely agree with Mr. Messent. If he had only specified for a test output and was satisfied with 50 per cent. of it, he had nothing to complain of. In fact, he confirms what I have said, that he ordered his dredger to do 50 per cent. more than he expected to get.

A.—Why all these complaints about the "Jinga" and "Kalu"?

Q.—I am suggesting to you that a wise and prudent man would have specified for a dredger that would have done something between 3,000 and 4,000 yards an hour on a test, in order to make certain of getting 2,000 yards an hour under ordinary conditions.

A.—Well, I say again that is a matter of opinion.

Q.—I suggest to you that there is no question of opinion about it whatever?

A.—Well, I do not agree.

Q.—In connection with the clay there is one point I should like to ask you about. You told the Chairman the other day that your references to hard clay meant clay in relation to its hardness in the reclamation?

A.—Yes.

Q.—On June 22nd, 1921, you use these words in a letter: "as we hope there will be a great deal of hard clay in the harbour."

A.—Yes.

Q.—I suggest that does not mean in the reclamation, but it means what it says—that the clay is hard in the harbour?

A.—Well, we have talked a great deal about the clay.

Q.—I thought probably you had not got this particular letter before you?

A.—Yes I had. I could never possibly in the highest flights of imagination believe that the material we were going to dredge in the harbour was hard clay, in the sense of being hard for the dredger to cut.

Q.—But you say you hope there will be?

A.—But hard there again ——

Q.—You call it hard clay. I am only taking your own words.

A.—Hard clay—well, I have talked very much about hard clay and soft clay and unctuous clay.

Q.—You have always defined it as meaning hard clay in the reclamation?

A.—Yes.

Q.—I am pointing out to you that you have given another definition yourself here—that is hard clay in the harbour. That is before you touched it—nothing to do with the reclamation at all, but " in the harbour "?

A.—Well, I repeat, whatever I said, that I could never have meant hard clay for dredging, because I knew perfectly well there was not any.

Q.—I agree with you that it is a very difficult thing to try to explain away. I sympathise with you.

A.—I do not agree at all. Once one starts to define what is hard and what is soft, you get involved in all kinds of language. You can have a hard boiled egg.

Q.—You can have a hard drink and a soft drink.

A.—Yes, and you can have a hard-mouthed horse.

Q.—You can have a hard head and a soft head.

A.—You can have clay that is soft and you can have steel that is soft and hard.

Q.—We know what " hard " means in connection with clay. I was very much interested in some tables given to us the other day by Mr. Settle. He gave the velocity of the effluent from the pipe as the same as Sir John Biles said was to be expected. In order to get 2,000 yards an hour the solid matter would have to be on an average for the whole 15 hours a day of no less than 14 per cent. in clay. Everybody who has given evidence before us has agreed that when you get 10 per cent. you are doing quite satisfactorily. Ten per cent brings us back to something like what the dredger has done. You will excuse me being rather disjointed, but the Chairman has been so exhaustive that I have to pick out the little points which he has not touched upon. There is one thing I would like to get on the notes, and that is this. The project estimate is stated to be 702 lakhs?

A.—Yes.

Q.—It really is not anything of the kind. It is 813 lakhs, because it is 775 lakhs without deducting the reclamation value of the dredging plant and the other plant. To that must be added 38 lakhs for concrete blocks omitted—that is, to compare it with the original estimate, you must add those 38 lakhs. That brings you a total of 813 lakhs as the gross project estimate.

A.—That seems rather curious arithmetic. The project estimate was 702 lakhs. You cannot go and add 30 lakhs which you are not going to spend.

Q.—I mean for the purpose of comparison with the original estimate?

A.—Yes.

Q.—You cannot compare one with the other if you do not do the whole thing, can you?

A.—Well, when you come to comparisons of that nature you can carry it on indefinitely.

Q.—Do you mind giving me the blue file of yours that you lent me the other day, of the estimates? (*Same handed.*) This is my last subject, I am glad to say. I noticed in looking through this the other day that nearly all the estimates of various things are in manuscript, but when I come to dredging it is in type?

A.—Yes.

Q.—And appears to have been torn off a full page?

A.—No; that is the copy out of the file; that is the exact copy.

Q.—Out of the file of what?

A.—Out of the file of one of our office files.

Q.—To me this is nothing in the nature of an estimate at all. It simply says dredging so much, and the working expenses, wages, fuel, stores, run into millions of rupees?

A.—Yes.

Q.—I do not see how that can be called an estimate. Where are the details of that? Who worked those figures out in order to arrive at the price of dredging?

A.—They are worked out in the office.

Q.—Who really worked them out? Can he give us the details on which he arrived at these?

A.—I really could not tell you. But what is the matter with them?

Q.—This is only a bald summary; it looks as if it had probably been supplied to you by somebody else.

A.—As a matter of fact, there is a great deal of detail in it. We do not always go into such details.

Q.—Take the working cost, wages 720,000 rupees: what does that mean—how many men and how many dredging masters? It is no estimate at all to me. Then fuel, 1,680,000 rupees. It does not give the quantities or the prices. How can it possibly be checked?

A.—Well, we do not make estimates the way that contractors make estimates. As you know perfectly well, we go by comparisons with other works. Certainly we got that out as an aid, but I would like to give you some records of the actual dredging costs in other works.

Q.—Are they under the same conditions?

A.—Yes, more or less the same conditions.

Q.—Are they with two dredgers, because this is quite unusual dredging at Bombay, is it not?

A.—It is quite unusual dredging—yes, I suppose it is—but the working costs of dredgers are fairly uniform.

Q.—According to this, the cost of dredging, steam dredger and steam float shore delivery was going to be 7·35 annas per cubic yard. Can you tell me, if dredging costs are fairly uniform, why it cost you 1*s.* 6*d.* in Rangoon?

A.—It did not cost 1*s.* 6*d.* in Rangoon.

Q.—My information is taken from your published figures.

A.—I should like to see that very much.

Q.—It is in the Institution of Civil Engineers' Journal?

A.—I should like to see it.

Q.—Here is the volume. (*Same produced.*) It is 1*s.* 6½*d.*

A.—May I see it?

Q.—Certainly. (*Same handed.*)

A.—There is no statement there that the dredging cost is 1*s.* 6½d. It is an inference of yours.

Q.—It gives the quantity done, and it gives the total cost, and the one divided by the other gives 1*s.* 6½*d.*

A.—If I may say so, that is absolutely misleading.

Q.—It is?

A.—Absolutely.

Q.—Why was it ever published if it was misleading?

A.—I say that that inference of yours is absolutely misleading.

Q.—It is not an inference, it is a calculation.

A.—I would like to read you some notes about dredging.

Chairman.—Let us get that accurate. Apparently, this is a lecture or paper read at the Institution of Civil Engineers?

A.—Yes.

Q.—At which a certain amount was said to have been the cost of the work, and a certain volume of work was done?

A.—Yes.

Q.—Sir Frederick Hopkinson has divided one by the other, and says it works out at 1*s.* 6½*d.* per cubic yard.

A.—Yes.

Q.—That is right, is not it?

A.—No.

Q.—Why is not it right? Will you explain it to him?

A.—He has taken the whole cost of the dredger.

Sir Frederick Hopkinson.—I have taken the net cost after sale.

Mr. Billimoria.—Do not the figures speak for themselves?

Sir Frederick Hopkinson.—I am afraid the figures shout for themselves.

Chairman.—You might just look at these figures and see if it is right. You have told us that the dredging did not cost 1*s.* 6½*d.* Take your own time about it, and just see whether Sir Frederick Hopkinson is right about that, on your own statement to the Institution.

A.—Well, I do not think he is right.

Q.—Why not? He says that five divided into 20 goes four times.

A.—It will take a few minutes to check this, but I do not think that he is quite right.

Sir Frederick Hopkinson.—My own is only a calculation.

A.—As a matter of fact, I can tell you the actual cost of the dredging in Rangoon.

Sir Courthope-Munroe.—Perhaps you will let Sir George deal with that after lunch. It has been sprung on him in this, and he wants time to develop it.

Sir Frederick Hopkinson.—Yes; but I did mention it the other day.

A.—" The suction pump dredger ' Pelican,' working in Rangoon in 1912 and 1913 in sand and silt, moved 2,000,000 tons at a total cost for working expenses of 1·90 annas per cubic yard."

Q.—Where is that? That is different to the information published in that book. Moreover, the information published in that book said that she did not move 2,000,000 yards, but the 2,000,000 was done partly by dredging and partly by scouring. Subsequently a letter was written by your late partner Mr. Meik, in which he said the total dredging done was 1,000,000 cubic yards?

A.—Well, this is an official record which I have got—1·90 annas per cubic yard.

Q.—Obviously that is wrong, or Mr. Meik is wrong. If one says 2,000,000 and the other says 1,000,000, they cannot both be right. When you first went to Simla you told them there that your estimate for dredging was 6 annas a cube yard. The work in Rangoon is pre-war prices?

A.—Yes.

Q.—Does that include the dredger?

A.—No.

Q.—That is only the working cost?

A.—The working cost.

Q.—That was sand and silt?

A.—That was sand and silt. I have got a lot of information about dredging.

Q.—I shall be glad to know where it has ever been done for 2 annas a cubic yard post-war.

A.—Well, 1915, I suppose you would call pre-war, or post-war—I do not know.

Q.—Where was it?

A.—In Burma. You might kindly note that Mr. Messent, when I saw him in 1919, told me that the working costs of dredging between pre-war and 1919 had only increased by 20 or 25 per cent.

Q.—I am afraid I should believe that with a good deal of difficulty.

A.—That is the chief engineer of the Port Trust.

Q.—I doubt that, knowing the rates of fuel and wages.

A.—Would you like me to give a little experience of dredging? It would only take me a minute.

Q.—Certainly.

A.—I have taken an opportunity of looking through some of my records. This is what I have got to say about dredging costs: In estimating dredging costs two factors must be considered, capital cost of plant per unit and working cost per unit. The capital cost naturally varies according to the quantity dredged, the greater the quantity the less being the capital cost. In two dredging propositions of, say, 10 million cubic yards and 5 million cubic yards respectively, executed by similar dredgers, the capital cost per unit of the large scheme would be less than that for the smaller scheme, if the total cost of the plant was debited against each scheme. Working expenses, however, are fairly uniform, and comparisons can be made with different works. In my 1919 report and estimate I calculated that capital cost of plant would be 3.24 annas per cubic yard, and working expenses 2.66 annas—total 5.90 annas; but in my estimate I allowed 8 annas per cubic yard, an increase of 2.1 annas, or on the total the sum of Rs. 32,81,250, say £216,000; whilst dividing 2.09 annas equally between capital and working expenses, we have capital cost 4.39 per cubic yard, working expenses 3.61 per cubic yard. It has been freely stated that my estimate of 8 annas was too low because Mr. Kidd's tender, made in 1912, was 9 annas 3 pies per cubic yard. I again assert most positively that my estimate was a reasonable one, and that Mr. Kidd's was excessive. Mr. Kidd gave no details in his tender, but in the course of his evidence before the Committee, said his dredging plant was estimated to cost in 1912 £287,625, which converted into rupees at 15 and divided by 24,162,463 comes to 2.86 annas per cubic yard. I consider his price for plant in 1919 high, but assuming that amount is allowed, there is left for working expenses 6.39 annas against my figure in 1919 of 3.6. The easiest way to see which figure is correct is to take reliable figures of cost of

dredging executed elsewhere about that time, and I will therefore quote figures in my possession which I used to check my estimate. Take the Twante Canal, Burma: This project was the nearest in approach to the Bombay scheme. Three suction cutter pipe line dredgers were used, the material was clay and silt, and the total working expenses for the six months ending 30th June, 1915, was annas 1.83 per cubic yard, and for the previous six months 1.88 annas per cubic yard, and from the beginning of the work in 1912 the dredgers had excavated 10,420,000 cubic yards, the total working expenses being 2.01 per cubic yard. To take some more examples from my records: Dredger "Pelican"—The suction pump dredger "Pelican," working in Rangoon in 1912 and 1913 in sand and silt, moved 2 million tons at a total cost for working expenses of 1.90 annas per cubic yard.

Q.—I hope there is not going to be the same conflict in all the other cases as there is in this case, because your partner says 1,000,000 yards was done, and the cost was 1s. 6½d.

A.—The suction dredger "Balari": This is a large suction dredger working on the Hooghly, and an analysis of her work in 1914 gave total working expenses of 8.40 pies per cubic yard. The suction cutter pipe line dredger "Foyers": Working in Bengal in 1914 moved 3,200,000 cubic yards at a total working cost of 10 pies per cubic yard, and working from 1908 to 1915 moved 14,230,000 cubic yards at a total working cost of 1.16 annas per cubic yard. These examples from actual work done are, I think, sufficient, and surely with these figures before me I was justified in thinking Mr. Kidd's estimate of 6.39 annas most excessive and my estimate of 3.71 annas ample—the difference between Mr. Kidd and myself on the whole 25 million cubic yards being Rs.53,22,000, or over £350,000. I have no information in detail as to the cost of dredging in Bombay on the Back Bay scheme, and am perfectly satisfied that with proper organisation and continual working enormous economies can be effected. These figures are taken from official documents which show that the dredging in 1915 was in the neighbourhood of 2 annas, and less, per cubic yard.

Q.—You want to be very careful in comparing these figures. For instance, in the Twante Canal, Burma, you have three suction cutter pipe line dredgers being used, but they would be working independently?

A.—Yes.

Q.—Did they deliver 5,000 feet, or only just a few hundred feet?

A.—No; they did not deliver 5,000 feet.

Q.—Then you cannot compare it. Can you compare that with two dredgers working on the same pipe line? Your costs are double, are not they?

A.—No; not double.

Q.—How much less does it cost to run the "Colaba" than the "Lloyd"? The only thing that the "Lloyd" does that the "Colaba" does not do is to cut clay and lift it. She does not lift it any more than the "Colaba," so that the costs are almost identical.

A.—No; I will not admit that, but, however, here are the figures showing what the dredgers can do. You can take them for what they are worth. Those are figures taken not working 24 hours a day. Most of these were Government works, being done in a more or less leisurely way. They are not contractor prices.

Q.—I have shown that they are not comparable. For instance, your dredging plant in Bombay cost you 8 annas, as much as your total estimated cost. You cannot say there is any uniformity in dredging prices when that sort of thing happens.

A.—But there is a certain uniformity in dredging costs.

Q.—There is no uniformity in the figure you have given us. You give us there 8.40 pies, which is less than a penny a cubic yard.

A.—Less than a penny. These figures are given you to show there is still hope of reducing expenses in Bombay.

Sir Frederick Hopkinson.—Do not ask me to take a contract on these prices, Sir George.

Chairman.—Would you between now and half-past two just work out that calculation which Sir Frederick Hopkinson has put to you—that the cost in Rangoon is 1*s.* 6½*d.* per cubic yard?

A.—Yes.

(*Adjourned for a short time.*)

Chairman.—In the report of Lord Lloyd's examination contained in a Bombay paper which has arrived by this mail, the summary of the evidence does not accurately convey what took place. In Bombay Mr. Cowasji Jehangir had said that Lord Lloyd took away a good deal of private correspondence. Sir M. Visvesvaraya put questions to

Lord Lloyd to ascertain if any of that correspondence was relevant and available. There was nothing in any of the questions put by Sir M. Visvesvaraya which in any way suggested any impropriety on the part of Lord Lloyd; indeed Sir M. Visvesvaraya expressly disavowed it. The object of the questions was to get, if possible, information which would give the Committee the circumstances under which the decision was arrived at to undertake the scheme.

Sir H. Courthope-Munroe.—I was going to ask this, Sir. We have been, at your request, during the adjournment at some little trouble to arrive at this 1*s.* 6*d.* The best we can do in the way of arithmetic is to arrive at 8*d.* Sir Frederick Hopkinson asked "Can you tell me at what cost?—(A.) No, I cannot. (Q.) I will tell you, then. It cost 1*s.* 6*d.* a cube yard." I rather gathered from that that it appeared in the Lecture or in the Address which was given by Sir George that he stated 1*s.* 6*d.*

Chairman.—I did not quite gather that.

Sir H. Courthope-Munroe.—I may be wrong.

Chairman.—What I gathered was that the figures given in the Address enabled Sir Frederick to get out the calculations.

Sir H. Courthope-Munroe.—It is a little hard on Sir George.—He has put together every figure he can find, and he cannot arrive at anything but 8*d.* Sir Frederick Hopkinson says his figure is 1*s.* 6*d.* I have not the privilege of cross-examining Sir Frederick, but no doubt he will tell us the sum by which he arrived at 1*s.* 6*d.* in order that we may clear up the matter.

Chairman.—I have not the privilege, either, of cross-examining Sir Frederick, but by to-morrow morning you shall have the figure.

Sir Frederick Hopkinson.—Certainly.

Sir H. Courthope-Munroe.—We have done our best, and we cannot get more than 8*d.*

Sir M. Visvesvaraya.—Will you explain how you arrived at 8*d.*?

Sir H. Courthope-Munroe.—By all means. Sir George is there and he will tell you. It is not my 8*d.* It is his 8*d.* He will tell you how he comes by it.

Sir Frederick Hopkinson (*to the Witness*).—Will you tell us how you arrived at your figure of 8*d.*?

A.—Somebody seems to have abstracted my calculations.

Sir H. Courthope-Munroe.—The only question is, as a matter of fairness, seeing that Sir Frederick has made the allegation of 1*s.* 6*d.*, might not we have his explanation first?

Sir Frederick Hopkinson.—There is no allegation at all?

Chairman.—No, we must clear this up. We will get to the bottom of it. It must be a matter of calculation.

Sir H. Courthope-Munroe.—It must be that some figures want explaining.

Chairman.—Now, Sir George, will you tell us how you arrived at your 8*d.*?

The Witness.—At page 39 of my paper you will see, "Dredging plant, net cost, £54,665, and dredging £23,253, total £77,918. Then, to be quite fair, we have put on £2,600 for engineering expenses and miscellaneous. That comes to £80,518. Looking at page 40 of the same book it says: "The dredger ceased work at the end of August, 1913, having removed 54,584,000 cubic feet." That equals 2,021,000 cubic yards. Putting one into the other the cost per yard comes to 8·72*d.* That is all.

Sir Frederick Hopkinson.—I think your paper also states that 2,000,000 yards of dredging included the amount that had been scoured, and during the course of the discussion afterwards, Mr. Meik said "the quantity of material dredged in the channel in front of the wall did not amount to 1,000,000 tons."

A.—That is a pious opinion of Mr. Meik, but as a matter of fact, whatever was scoured was moved by the dredger.

Q.—It is not so.

A.—However, there are the figures.

Q.—Your paper somewhere says, "Dredged and scoured"?

A.—I am simply going on these figures. "The dredger ceased work, having removed 54,584,000 cubic feet."

Q.—Where is that?

A.—Page 40, "and formed a channel averaging 600 feet wide with depth below low water range from 20 to 40 feet."

Chairman.—It comes to this. If you take dredged and scoured as equivalent to dredged, the price works out at 8·72*d.*?

A.—That is right, yes.

Chairman.—If you accept Mr. Meik's statement as correct, that the quantity dredged did not exceed 1,000,000 tons—is that the figure?

Sir Frederick Hopkinson.—That is not as much as a cubic yard. This costs 1*s.* 6½*d.* a ton. A ton is 20 and a cubic yard is 27, so my 1*s.* 6*d.* is very much below.

Witness.—But I do not accept it as correct. It was a mere pious opinion expressed by Mr. Meik at the meeting.

Chairman.—Wait a moment, Sir George. Mr. Meik was your partner?

A.—Not at that time.

Q.—Had he any special knowledge of this work?

A.—No, no particular knowledge. I was away at the time, and he was present when my paper was read.

Q.—It does come to this—that on your showing, if you accept dredged and scoured as equivalent to dredged, it is 8·72*d.*?—

A.—Yes.

Q.—If one gives weight to Mr. Meik's statement that the dredger did not do more than 1,000,000 tons, then Sir Frederick Hopkinson is right that it works out at rather more than 1*s.* 6½*d.* a ton?

A.—But what was scoured was moved by the dredger. It was caused by the action of the dredger.

Sir Frederick Hopkinson.—Was it not caused by the action of the wall?

A.—No. The dredging was finished before the wall was started. We had moved the dredger. The dredger ceased to work at the end of August, 1913. After that, when the dredger had been removed and the wall was practically finished, then the scour began. But my point is that the reasonable figures to take are those stated in the report.

Chairman.—We see how it stands.

Sir Frederick Hopkinson.—There is a paragraph somewhere in this (I cannot put my finger on it at the moment, but I will look it up later) in which it is said that the 2,000,000 included both dredging and scouring. But supposing we leave it there for a moment, and take your price of 8·72*d.* per ton, or cube yard?

A.—8·72*d.* per cube yard.

Q.—Very well. That was pre-war, was it not?

A.—That was pre-war.

Q.—Your dredging plant at Bombay cost four times as much as the dredging plant pre-war?

A.—Yes.

Q.—Then that 8·72d. goes, does it not?

A.—I do not see the analogy at all. You cannot compare dredging propositions in that way. As I said in my note, which I read before lunch, you can make some comparisons in the case of capital cost and working expenses; but naturally the capital cost of a dredger which removes 10,000,000 tons is very much less than the capital cost of a dredger which only removes 1,000,000 tons.

Q.—That does not touch my point. It is bound to be much more when the capital cost comes to four times as much. Can you get away from that?

A.—I do not see what you are driving at.

Chairman.—May I try to put it? In your estimate of 125 lakhs for the dredging you included the total cost of all the plant which you estimated would be necessary?

A.—Yes.

Q.—That is, you took the probable cost of a dredger, of a booster and of the pipe lines?

A.—Yes.

Q.—You took that, I suppose, as your first item of cost?

A.—Yes.

Q.—Then I suppose you would make a calculation as to the cost of labour for the actual dredging operations?

A.—Yes.

Q.—And the period over which that labour would have to be paid?

A.—Yes, in a measure.

Q.—There may be other items, but anyhow there would be those. What Sir Frederick Hopkinson is putting to you is that if your dredger is going to cost four times the amount in 1919 that it cost in 1912, you at once get a much heavier ultimate dredging cost?

A.—Naturally.

Chairman.—That is the only point which Sir Frederick is putting to you about it.

Sir Frederick Hopkinson.—Two per cent. of 702 lakhs, the project estimate cost, is £105,000 approximately; is it not?

A.—Yes.

Q.—You have disclaimed all responsibility for the construction of the work and for the management of the work. The Committee would like to know what you understand the Bombay Government is paying you that large sum of money for?

A.—I am not prepared to discuss that point. You have got my agreement.

Q.—There must be something?

A.—No, I am not prepared to discuss that point.

Q.—But you must agree that there must be some *quid pro quo*?

A.—I say there is a very adequate *quid pro quo*. However, that is a matter of my agreement, and I think we might leave it at that.

Q.—I have now a few questions to ask you on the general subject of estimates. I should like to point out that on page 16 of your original estimate you give an estimate for the completion of the various areas. No. 1, 354 acres, was to be complete in February, 1923. No. 2, 289 acres, was to be complete in June, 1924. No. 3, 298 acres, was to be complete in May, 1925, and No. 4, 204 acres, was to be complete in December, 1926. That is the total scheme?

A.—Yes.

Q.—December, 1926—that is next month. Up to the present time no single one of those areas is complete, is it?

A.—No, I do not think any one of them is complete.

Q.—And only one of them is really seriously started?

A.—It is so long since I have been at Bombay that I do not know what the situation is.

Chairman.—They tell us they hope to get Block 8 done by May, 1928.

Sir Frederick Hopkinson.—With regard to this file of estimates which you left with me this morning, I cannot see that any of the detailed estimates made here are carried into any summary and allocated to the various works; but I should need probably an hour or two to go through that with you, and I do not think we can spare the time for it now. I think we had better leave it.

Chairman.—Very well.

Sir Frederick Hopkinson.—You say in a letter which you sent us the other day, or in a statement which you made, that it was notorious that prices of labour and materials had soared by leaps and bounds between 1919 and 1922?

A.—Yes.

Q.—I suggest to you that that is not correct—that the major increase in prices occurred before 1919, and that by 1922 the prices were down to the 1916 prices; that when Government control was taken off on April 13th, 1919, prices had a sudden jump then and went up to September, 1920, and then they fell rapidly to May, 1921, when they were down to the 1919 prices, and in 1922 were down to the 1916 prices. You say further that the prices of dredging plant had increased by something like 100 per cent. between 1919 and 1922. Simons' price for dredging plant was £190,000, I think it was. That would have made it £380,000 by 1922; but actually from the prices on which the contract was let the Government got a rebate from Simons?

A.—They did.

Q.—Which shows that prices have fallen?

A.—Yes.

Q.—Since they took the order. I do not quite understand, then, why you should say that the prices of labour and material had soared by leaps and bounds between 1919 and 1922?

A.—It is common knowledge that the price of Indian labour did increase by leaps and bounds from 1919. It was from 1919 that the price of labour did increase. The Special Committee appointed by the Government of Bombay to report on the scheme remarked in their report, dated November, 1925, quite gratuitously, because they would not report in my favour, that the excess was due—that is the excess for the 702 lakhs estimate—to the fact that " since Sir George Buchanan prepared his estimate the prices of working materials, fuel and labour had risen considerably. Also Sir George Buchanan's estimate had been based on exchange at 12 rupees to the £, whereas when the plant was imported in 1921 the rate was in the neighbourhood of 15 rupees to the £. That is the opinion of the special Committee appointed by the Government of Bombay.

Q.—Actually, labour rates in Bombay have never been more than double pre-war rates, have they?

A.—I was not engaging labour in Bombay, but the chief engineer, Mr. Lewis, certainly put it on record in his earlier letters that the way prices were going up, particularly of labour, was astonishing.

Q.—It never more than doubled itself between then and pre-war?

A.—There is the statement of the special Sub-Committee, deliberately appointed, and as I say they were not reporting in my favour. They gratuitously make that statement.

Q.—Do they say between 1919——

A.—They say: "The excess was due to the fact that since Sir George Buchanan prepared his estimate the prices of working materials, fuel and labour had risen considerably. Also Sir George Buchanan's estimate had been based on exchange at 12 rupees to the £, whereas when the plant was imported in 1921 the rate was in the neighbourhood of 15 rupees to the £."

Q.—All plant had been paid for in sterling. Therefore the rate of exchange does not enter into it at all?

A.—It certainly does.

Sir Frederick Hopkinson.—I think that is so, is it not, Mr. Billimoria? All plant has been paid for in sterling from Bombay?

Chairman.—Yes, but if you are paying £480,000 in England and your rupee is worth 1s. 8d., you have to spend far fewer rupees than if your rupee is worth 1s. 4d. That is the point.

Witness.—The point is that when this plant was paid for the rupee was 1s. 4d.

Sir Frederick Hopkinson.—But we have all along been dealing in sterling in all the prices for plant.

Chairman.—That is true, but when Sir George Buchanan puts an estimate of 367 lakhs, he is basing it on the rupee being worth 1s. 8d.

Witness.—Twelve to the £.

Sir Frederick Hopkinson.—Can you tell me off-hand how you made only 1,000,000 cubic yards less filling than Mr. Kidd had?

A.—I cannot tell you off-hand. I thought I had made it more.

Q.—No, a little less—dredged filling?

A.—Mr. Kidd made it 24,000,000 cubic yards and I made it 25,000,000 cubic yards.

Q.—That is right. He made it 24,100,000 and you made it 25,000,000. You made it nearly 1,000,000 more?

A.—Yes.

Q.—Was that a lump sum put on, or was it the result of calculation?

A.—Of course it was not put on. It was the result of calculation.

Q.—But you had no plans to work accurately to. You only had about two cross-sections over four miles of foreshore?

A.—I had all the cross-sections which Mr. Kidd had taken, at all events.

Q.—I think there were only two?

A.—I would not say that.

Q.—You estimate the total cost of the staff and supervision at 17.98 lakhs. Call it 18 lakhs. Actually it is costing 6¼ lakhs a year, so your estimate is only half the supervision?

A.—But, Sir Frederick Hopkinson, it is "Engineering charges, including all establishments, 17.98 lakhs." That does not include the whole of the establishments carrying out the works.

Q.—I quite understand that, but that is the establishment charge. You take the same basis of establishment as they take in Bombay. It only includes the superior establishment charges?

A.—It is "Engineering charges including all establishments." That means——

Q.—What it says, I take it?

A.—Yes.

Q.—Establishment charges are well understood?

A.—What do you say the establishment charges actually are?

Q.—They are double what you have allowed. They are 6¼ lakhs a year, and you took 18 lakhs for five years?

A.—Yes, and their 6¼ lakhs includes the establishment on the Khandivli Quarry.

Q.—Of course. That is part of the works, is it not?

A.—Not included in this estimate—not in the engineer's estimate. These are all included in the prices. No engineer's estimate includes under "establishment" prices of that kind.

Q.—Can you show me in any of these figures where you have got establishment charges charged to the Khandivli Quarry?

A.—No. Why should I?

Q.—I am sure you cannot. Can you show where it is allowed for in the prices?—

A.—We are discussing the matter from different points of view. You are discussing it from the point of view of a contractor making up a tender, and I am discussing it from the ordinary point of an engineer's estimate.

Q.—What do you include in it?

A.—That is an ordinary engineer's estimate at so much a cubic yard and so much a cubic foot.

Q.—But what is your establishment?

A.—I do not deal with establishment. It is "Engineering charges including all establishments."

Q.—"Including all establishments." What does it include?

A.—That includes the resident engineer and his office, and all our fees.

Q.—Does it not include all the other engineers?

A.—No.

Mr. Billimoria.—May I point out that this is a round figure of 5 per cent. added on? There is no calculation about it.

Sir Frederick Hopkinson.—No calculation at all.

Mr. Billimoria.—It is only a 5 per cent. addition.

Witness.—Very well; that is usual.

Chairman.—I confess I do not quite understand this point. Will you continue, Sir George? Sir Frederick Hopkinson has asked you what it includes. You say it includes your own fees and your own establishment?

A.—It includes presumably the resident engineer and his office.

Q.—It includes the resident engineer, the cost of the resident engineer's office; anything else?

A.—Yes, I suppose it would include the deputy-resident engineer. I cannot think of anything else.

Sir Frederick Hopkinson.—But surely the two engineers would not come to as much as 2 per cent—your fees. Does it not include the constructional engineers?

A.—No.

Q.—Surely they are establishment. Does it include the clerks? Are not they establishment?

A.—"Engineering charges including all establishments, 5 per cent." That is a usual figure to put on to estimates, as you know. If you want to know whether I worked out a detailed establishment for the whole of these works, certainly I did not. It was not my business to do so.

Q.—I am pointing out that your estimate is less than half what it costs.

A.—And I am pointing out that the whole of the establishments, if it had been let by contract, would be contractors' charges.

Chairman.—I may point out that Sir Frederick Hopkinson has been reading from Page 29. A reference to Page 13, item No. 5, Table B., shows that you altered the phrasing of it a little. "Engineering and management inclusive of establishment and all other charges." Does not that mean all the necessary cost of establishment?

A.—No, it does not include all the clerks for the contractors' part of the work.

Sir Frederick Hopkinson.—Where is that included?

A.—It is included in the figures.

Mr. Billimoria.—If you look at Page 30 you will find "Wages, stores and fuel" only are provided for in those other working costs—nothing more. None of the management expenses or overhead charges are there.

Sir Frederick Hopkinson.—Wages, stores and fuel. The rest is all supervision and establishment.

Mr. Billimoria.—That is so.

Sir Frederick Hopkinson.—I do not think I can carry that any further, but I would like to call your attention to an interesting little calculation. If you take Mr. Kidd's estimate, deduct the roads and drains, and add on 10 per cent., you get almost exactly your estimate of 1919, minus roads. In one case it is 292·36 lakhs, and in the other case it is 292·61 lakhs—almost identical figures?

A.—Yes. I do not see what is the inference.

Q.—I am pointing out an interesting fact.

A.—I do not see what the analogy is.

Q.—I am going to draw your attention to various things in connection with the estimates. Take the muram topping, for instance, in 1919. You said it was going to be 1,830,000 cubic yards. In February, 1922, you said it was going to be 3,660,000 yards—doubled?

A.—Yes.

Q.—Why is that?

A.—In February, 1922, did you say?

Q.—February 11th, 1922?

A.—Is that in a letter?

Q.—Yes, Page 63, the middle paragraph?

A.—I cannot see it.

Q.—" Referring to the revised estimate accompanying Sir George Buchanan's report dated 11th February, 1922, we find that the quantity of muram allowed therein is 100,000,000 cubic feet." That is double what was in the previous estimate?

A.—Yes, but there is nothing peculiar about that. As a matter of fact that estimate was not accepted, so why argue about it.

Sir Frederick Hopkinson.—I am pointing out to you the disparity in these various estimates. I have got a lot more points to put to you.

Mr. Billimoria.—A higher estimate than that was accepted. The 702 lakhs estimate was accepted. This is only 598 lakhs.

Sir Frederick Hopkinson.—I am going to suggest to you later on that the word " estimate " has been very grossly misused?

A.—I resent that suggestion.

Chairman.—I would like to know how it is that in February, 1922, you are suggesting twice the amount of moorum that you put forward as necessary in 1919? What was the reason?

A.—The reason was that Sir Lawless Hepper, as I told you the other day, asked me to put on to that estimate of mine 100 lakhs and divide it amongst the equipment of the area and the moorum filling, because he did not think we had got sufficient.

Q.—I wonder if you have got to hand that document, because I would like to see whether there was any contemporary alteration. Do you remember there was an alteration where you wrote the words in pencil, " storm water and sewerage "? You remember that?

A.—Yes. I have not got that with me. I will let you have it.

Q.—Again, I do not follow that. Did you consider that it was necessary to load your February, 1922, estimate by doubling the amount of moorum, or not?

A.—It was discussed.

Q.—Did you agree that it ought to be done?

A.—I did not think there was any particular objection to it. It had been put into the project estimate. In any case, nothing was done with this particular estimate, so why discuss an estimate which, in reality, was put into the waste paper basket?

Q.—The value of it is that it has your signature to it as an estimate revised and approved by you. That is the importance of it. If, of course, you did not believe that the moorum topping would cost 60 lakhs, but that it would only cost 30 lakhs, you would not have put it into your revised estimate. The question is, what was the reason?

A.—There was no objection to putting it into the estimate. They wanted a big estimate. There was no objection. We did not know exactly how much moorum we were going to put in. Sir Lawless Hepper said, " Better have a large sum than a small sum." We do not know now how much moorum is going to be used.

Q.—In point of fact, really, the extra amount of moorum was the difference between 1 ft. and 2 ft., was it not?

A.—Yes.

Mr. Billimoria.—May I point out that, out of the 100 lakhs which Sir George has been mentioning, 85 lakhs consist of only two items—roads, lights, storm water drains, etc., 60 lakhs, and 25 lakhs for contingencies, leaving only 15 lakhs to be apportioned among the other items. So that could not be with regard to moorum topping at all?

A.—Well, it was.

Mr. Billimoria.—85 lakhs are covered by only two items—25 lakhs for contingencies, and 60 lakhs for storm water drains. That leaves a figure of 15 lakhs to be accounted for, which, if spread over all the remaining items, 1 to 10, could not have gone into one item alone of moorum topping?

Sir Frederick Hopkinson.—Which all points to my remark about the misuse of the word " estimate."

Witness.—I resent that suggestion. I say that at the time these estimates were prepared they were the ordinary engineers estimates. I am willing to submit these estimates to an investigation by any impartial tribunal of Westminster engineers—absolutely willing.

Sir Frederick Hopkinson.—I should just like to run through the difference between Mr. Kidd's estimates and yours. With regard to Back Bay, Mr. Kidd says it is full of rocks and pockets, and impossible to get material for reclamation. You say the same. Incidentally, both of you appear to have been wrong.

A.—Why?

Q.—Because Mr. Lewis says you can get 25,000,000 yards from Back Bay, and they are getting it at the present moment.

A.—They are not getting 25,000,000 yards.

Q.—They are dredging at the present moment——

A.—I have no knowledge of what they are doing at present.

Q.—I will tell you then. The area is the same in each case; the line of wall is the same; the dredged material is the same; the dredging plant, 2,000 cube yards an hour, is the same, except that Mr. Kidd provided 7,500 H.P. and you provided 3,000 H.P.

A.—I beg your pardon. That 7,500 H.P. of Mr. Kidd's has not been verified.

Chairman.—We are making inquiries about that.

A.—It has not been verified yet.

Sir Frederick Hopkinson.—Make any deductions from what you like, you will find that you may possibly get it down to 6,000.

A.—It is no good making any guesses until you have the figures.

Q.—We know the horse-power of the winches, and we know the horse-power of the propelling engines, and we know the ordinary service pumps in the boat. Dredging plant, 2,000 cubic yards an hour, is the same; the booster was the same and the quantities were the same. Sea wall, the rubble bank is slightly different. Mr. Kidd provided for 25-ton concrete blocks; you provided for 20-ton blocks. Again, incidentally, neither of those were required. A foot of moorum topping is the same in both cases. Mr. Kidd provided seven pipelines and you provided five. The storm drains were omitted by Mr. Kidd, and were also omitted by you.

A.—I beg your pardon.

Chairman.—I do not think you agree to that?

A.—I do not agree to that for a moment.

Sir Frederick Hopkinson.—Now the estimate details. Mr. Kidd had six items; you had seven items. Otherwise your estimates are the same. Mr. Kidd gave his estimate of plant and temporary works at £500,000. Yours have cost two and a half times—which shows that we are not very far out in taking two and a half as the difference between pre-war and post-war costs. Mr. Kidd says his is a safe estimate. You say your prices are reasonable and reliable and you never over-estimate?

A.—Yes.

Q.—There is very little difference between Mr. Kidd's project and yours?

A.—Except that I maintain that Mr. Kidd had over-estimated his dredging.

Q.—It appears that you under-estimated it—that, under the most favourable circumstances, it is costing over a rupee a cube yard. Against his cost of 9 annas, which would probably have been just about right, and yours of 8 annas, it is costing over 16 annas?

A.—I have given you a lot of examples to-day of dredging costs at 2 annas. Supposing you put on another 2 annas, that is 4 annas, and you get charged nearly 7 annas as this dredging cost?

Q.—I do not accept those instances which you have given us to-day. They are all instances of single-dredger working. You have two dredgers working on the same pipeline. Therefore your costs must be doubled?

A.—You can double Mr. Kidd's, and still have a margin of 2 or 3 annas.

Q.—I do not follow that. We do know that Sir Sydney Crookshank considered Mr. Kidd's a very careful and ably prepared project, and he did not attach any value to your comparative estimate of 241·9 lakhs.

A.—And the Chairman has pointed out that Sir Sydney Crookshank had had no experience of that kind of work, and therefore any opinion of his was not reliable.

Q.—Again, on the subject of estimates, the project estimate of the value of the plant was 67 lakhs—£502,000. Your estimate was 10 lakhs—£75,000, a difference of £427,000?

A.—I do not quite see where that is.

Q.—I will tell you again. The project estimate of the value of the plant is 67 lakhs.

A.—Of all plant, or dredging plant only?

Q.—All plant, I presume. That is £502,000. Yours was 10 lakhs, £75,000—a difference of £427,000.

A.—You mean dredging plant, or all plant?

Q.—I mean all plant—the credit which the work was going to get when they had finished, and sold the plant?

A.—I did not buy the plant. My point is that I had no responsibility for any expenditure on the works.

Q.—You do not see my point. I am trying to point out how this poor word " estimate " has been misused. Here is one engineer, in 1922, saying it is going to be worth £502,000, and you consider it is only going to be worth £75,000. That is the sale price at the conclusion. I want you to look at this from the point of view of the Government of Bombay?

A.—You mean allowing for the value of the plant on the completion of the work?

Q.—Yes. You put 10 lakhs, and Mr. Lewis put 67 lakhs for the value—realisation value.

Chairman.—He was very optimistic.

A.—It has nothing to do with me.

Chairman.—No.

Sir Frederick Hopkinson.—I am contrasting the two. I am sitting here in the position of the Government of Bombay for the moment and trying to realise how I should have been bewildered when I received such so-called estimates.

Chairman.—You came to the conclusion that, at the end of the work, the greater part of the material would be sold at scrap rate, and therefore you put it at 10 lakhs?

A.—Yes.

Q.—Mr. Lewis, for some reason that is not very clear, thought that, at the end of the work, the plant would be worth 67 lakhs?

A.—Yes.

Sir Frederick Hopkinson.—I should just like to put in a tabulated form, so that it can be seen when the Report is considered, the various estimates. Mr. Kidd's in 1912 was 325·23 lakhs. Sir George Buchanan's in 1919 was 367·61 lakhs. Sir George Buchanan's in Februray, 1922, was 598·89 lakhs. As it was submitted this was 498, but an extra crore was put on it for some reason.

A.—At the request of the Director of Development.

Q.—Then the project estimate of April, 1922, is 702·43 lakhs, and then in July, 1924, as a result of the decision to dredge Back Bay, Mr. Lewis made it 726·54. Mr. Elgee made a revised estimate in January, 1925, of 712·79. Mr. O'Rourke, for the Advisory Committee, and based on dredging results of 1924-25, made an estimate of 1,109·43. Mr. Elgee's present estimate is 1,000 lakhs. And there has been no essential alteration in the scheme from 1912 to the present day?

A.—Quite true.

Q.—Now I will just finish the roads. Mr. Kidd, in 1912, said the roads, drains, etc., were going to cost 59·45 lakhs. Sir George Buchanan, in 1919, said they were going to cost 75 lakhs. Sir George Buchanan, in February, 1922, said they were going to cost 135 lakhs, and Mr. Lewis, in May, 1922, said they were going to cost 211·90 lakhs?

A.—That sounds very——

Q.—Awful, does it not?

A.—No. Take that last subject of roads. You must remember that there was 136 lakhs equipment of the reclaimed area which had nothing to do with the 367 lakh estimate or had nothing to do with Mr. Kidd's estimate.

Q.—Yes, it is all in?

A.—Oh dear no.

Q.—Yes, it is.

Mr. Billimoria.—At page 13, if you refer to the report, the figure is there—59 lakhs.

A.—Fifty-nine lakhs was not to include the equipment of the whole of the reclaimed area, because no one knew how it was going to be equipped.

Sir Frederick Hopkinson.—What do you mean by all the equipment?

A.—Roads and sewerage works.

Sir Frederick Hopkinson.—It specifically says " roads."

Chairman.—Are not you rather in a difficulty over this in making that statement—because you never saw the Public Works Department estimate?

A.—No, I never saw the Public Works Department estimate.

Q.—You did not know what it contained?
A.—No, I did not know what it contained.

Q.—Therefore, not knowing its contents, why should you say so positively that the roads, lighting, and drains of the Public Works Department, 59·45 lakhs, did not include the lay-out?
A.—I cannot say, because I never saw the estimates.

Q.—In fact, you arrived at your figure of 75 by putting on a percentage?
A.—Yes.

Sir Frederick Hopkinson.—Once more referring to Mr. Kidd's details, if you look through his papers you will find that he gives rates for all sorts of people—the Chief Superintendent, Superintending Engineer, the Dredging Master, laddermen, Chief Surveyor, second engineers, engine-drivers, and so on. You gave none of that information?

A.—No, I would not expect to give it. No engineer would expect to give it. But I do give what Mr. Kidd does not give. I give the quantities of cubic yards of concrete and facing and tipped rubble, and so on.

Q.—I mentioned that. You split it into six items, and he gives it in one—lineal measurement. I should like to call your attention to the fact that the prices which the Directorate have recently been paying for all these men I have been speaking of—superintending engineers, and so on—are just about two-and-a-half to three times the price that is contained in Mr. Kidd's schedule, which again confirms our two-and-a-half. I should also like to get it on the notes as an interesting comparison between 1912 and 1920, that ship plates in 1912 were £8 10s. a ton and £24 10s. a ton in 1920, when the dredger was purchased.

Sir H. Courthope-Munroe.—Do you accept that, Sir George?
A.—I do not know.

Chairman.—The Director-General of Stores has proved that from official documents which he has put forward. It is all on a table here.

Mr. Billimoria.—Sir George, I am afraid I shall have to make some preliminary remarks before I ask you a few questions. You will appreciate that this is an Enquiry Committee, and if some of the questions appear on the surface to be unpleasant, you need not necessarily assume that these are intended to offend or annoy you. What I want are the facts and the truth, and we are particularly anxious that you should be good enough to help this Committee by enlightening us on the true state of affairs, as you may be able to do so, to the best of your ability and knowledge.

Chairman.—I think Sir George has been very helpful to us.

Mr. Billimoria.—I do not deny that. I have to make these observations so that there may not be any prejudice, or that any of my questions may not be misconstrued. What I want are the facts, and I shall be obliged if you will be good enough to tell us exactly what you know of the situation. Most of the ground has already been covered by our Chairman and my other colleagues who have preceded me, and therefore I shall confine myself to asking you a few questions with a view to eliciting a few further facts. I am very glad to observe that you have the benefit of being assisted by three legal luminaries of the British Bar. The Committee welcome those eminent lawyers here, but I find that it has not gone on our records, or at least on the evidence, as to the circumstances under which you were extended this special indulgence of appearing by counsel. I have to mention this, because when our Report is written and submitted to the people in Bombay, it is quite likely that questions may be asked in the Legislative Council, and in other public places, as to why this special concession was made in your case. I understand from certain statements that have been made by your eminent learned counsel, Sir Harry Courthope-Munroe, that you do not want to take up the attitude of being on trial or on your defence. May I therefore ask you whether you had any feeling that the public mind, being seriously agitated, and the scheme being likely to prove to be a financial failure of serious dimensions as the result of relying on your advice, you thought it advisable to engage counsel and lawyers to defend you?
A.—I can reply to that question, Mr. Billimoria.

Q.—If you please?
A.—No such idea entered my mind, but such extraordinary statements had been made in the course of the Enquiry in Bombay that I thought it would be advisable for me to have the assistance of the legal luminaries whom you have mentioned.

Q.—I very much appreciate that.
A.—That is the reason.

Q.—It clears the atmosphere to a very great extent, because you can understand that, when we get back, in certain political quarters questions may be asked as to why we showed special indulgence to you.

A.—Well, that is the reason.

Q.—Will you kindly turn to the book of correspondence, page 160, paragraph 2 of the letter written by Mr. R. J. Bell, Secretary to the Government of Bombay in the Development Department. It is dated 28th August, 1925. The Government of Bombay through their Secretary state as follows: " I am desired to emphasise the very unsatisfactory nature of these figures and to state that Government view with great dissatisfaction the slow progress of the work, which threatens most seriously to prejudice the financial prospects of the scheme. Government undertook the reclamation on the recommendation of Sir George Buchanan contained in his report of September, 1919." Have you any remarks to offer on the observations of the Government of Bombay as contained in paragraph 2 of this letter?

A.—Yes. I have given the reply several times.

Q.—Then, as you will observe, they go further and say: " The work cannot be completed until the year 1943, and the cost, excluding interest charges, will amount to 11 crores "?

A.—I do not accept that estimate.

Q.—Then in paragraph 3 they say: " So far, therefore, the matter of reclamation by suction dredging has proved a failure "; and in paragraph 5 they say: " In the circumstances I am to say that the Government call on you as the engineers for the scheme to take necessary steps without delay." I shall be very much obliged if you will kindly state what you have to say with regard to the observations made by the Government of Bombay as contained in the letter of the 20th August, 1925?

A.—I can only repeat what I have said before—that I do not think the dredgers have had a fair trial. I am only repeating what I have said several times, and you will excuse me repeating it once again. I would reserve an opinion until the work has been taken out of Government control.

Q.—By your suggestion of " a fair trial, do you mean in the year 1926? We are now at the close of the year 1926, when you expected the whole scheme to be completed?

A.—I say that the sooner the works are taken out of Government control and put into the hands of business people the better. In fact I will quote again what I said in my statement. " The creation of the Development Department and Directorate I consider, in the light of events, to have been a mistake. The Governor of Bombay (now Lord Lloyd) hoped that he would institute a new department with fresh blood, freed from the restrictions and red tape of other departments, but when he disappeared from the scene and with him the only driving force in Bombay, the Development Directorate degenerated to an ordinary Government Department slavishly following other departments and hide-bound by rules, regulations and restrictions. It was a Public Works Department being carried out on exactly similar lines to the recognised P.W.D. and subjected to precisely the same rules and regulations, but without its experience."

Q.—That is the explanation you offer with regard to the observations of the Government of Bombay. Now will you turn to Page 164, Paragraph 2, letter written by Sir Lawless Hepper to you dated 24th September, 1925, in which he says " It seems inevitable that Government will be faced with a very heavy loss." I am particularly bringing this paragraph to your notice because in the note which you have submitted you say that this is going to be a brilliant success. The Government of Bombay feel otherwise, and the people of Bombay feel very sore about it, because they know it is going to result in a very heavy loss. Paragraph 3 says: " The work will cost about 11 crores and will not be finished until about 1944-45."

A.—Those are all wild estimates. The estimate of 11 crores was a wild estimate.

Chairman.—You do not disagree with it if it continues in the same control, do you?

A.—No, not if it continues in the same control; I think it might go up to—well, I would not like to say how much.

Q.—In one of your letters you said the scheme, if worked at the rate at which it has been going on, would take 35 years?

A.—I did. I notice that some people have taken that seriously but as a matter of fact we tried a little sarcasm.

Mr. Billimoria.—May I now ask you to direct your attention to Page 175 of the book of correspondence, Paragraph 2. I will read one sentence only: " The data adopted by Sir George Buchanan in his report upon which he founded his estimates have been found to be unreliable." " These estimates, both as to time and cost will be exceeded beyond all reasonable allowance, and the item of dredging has been specially unsatisfactory." I suppose you make the same observations, do you?

A.—I do, certainly. I agree.

Q.—You do not agree with the Government of Bombay with regard to anything which they have stated in those various letter addressed to you?

A.—No. I think it would be better if they put their house in order.

Q.—Now will you kindly turn to page 129, which is a letter written by yourself to the chief engineer of the Reclamation Branch, dated 23rd July. In paragraph 2 you say that at the present rate of progress the reclamation will be completed in 35 years. In the light of what has happened do you at all doubt that this scheme will take 35 years to complete—knowing what has gone on in the past and how things have moved? Have you any doubts about it?

A.—It is difficult to express an opinion about 35 years.

Q.—That is your statement, Sir George?

A.—I was sarcastic. This statement about 35 years was written in a sarcastic mood.

Q.—In a sober moment how many years would you say it would take to complete the scheme?

A.—We hoped to arouse them by talking about 35 years.

Q.—Supposing they were in a very good slumber, how many years do you think it would take to rouse them?

A.—I think they ought to be aroused at once.

Q.—Talking seriously about it, Sir George, how long do you think it would take to complete the whole scheme? I am asking you because we have to recommend whether the scheme should be completed *in toto* or partially. Supposing this Committee decides that the scheme has to be completed, may we have the benefit of your advice as to how many years you calculate it would take for the whole scheme to be completed, taking into account the manner in which the work is at present going on, or alternatively with the necessary improvements which you no doubt could suggest?

A.—I am very sorry, Mr. Billimoria, but it would not be possible for me to give that information. It would really require a deliberate and considered investigation, and as I have no further connection at present with the scheme, I could hardly do such a thing. Your honourable colleague, Sir M. Visvesvaraya asked me more or less a similar question, and I then suggested, what I have suggested before—taking it out of the hands of Government and letting it out to contracts.

Q.—Seriously, how long do you think it would take?

A.—I should be very sorry to express an opinion.

Q.—I am very much disappointed at that answer, because the people of Bombay were looking forward to your advice and co-operation in this matter?

A.—I should be delighted to give you an opinion if I could, but you must remember that Sir Lawless Hepper thought the best thing he could do towards putting things right was to send me away, and he is now carrying on by himself. Sir Lawless Hepper said in his evidence that Government thought they had better leave him in entire charge. I should very much like to help you, but I have not got the information.

Q.—Very well then, we shall have to leave it at that. May I ask you one question with regard to your remuneration. You were paid a special remuneration for preparing and drawing up your report and estimate, and subsequently an agreement was entered into between yourself and the Secretary of State by which you were to be paid a commission of 2 per cent. on the total expenditure of the works?

A.—Yes, and which I may say we have not received.

Q.—You have stated you have received a substantial portion thereof. I take it that by now you have received something like six lakhs, or roughly about £50,000?

A.—I will take any figure like that, and I would again say what I stated the other day—and in regard to which Sir Frederick Hopkinson for once in his life entirely agreed with me—that when Income Tax and Super Tax and various other taxes and expenses had been taken off, there was not such a large sum left as one might imagine.

Q.—I appreciate that, but I suppose when you undertook the job you calculated all that; you foresaw it?

A.—Yes.

Q.—Every professional man, including myself, has always to look ahead in matters of that sort, so you cannot make any complaint about that?

A.—I do not make any complaints at all, only people have seemed to think it was a large sum of which we have had the entire spending.

Q.—I am raising the question because at Page 63 of your note you seem to be worrying about it. You say " We employed a permanent staff in our office whose time was chiefly devoted to the Back Bay reclamation scheme," and then you proceed to say that in many cases it has not paid your expenses. When the job was undertaken by you, I take it that you had anticipated what your expenses were going to be. You contemplated what staff you were going to employ—necessarily an expert staff because this

was of very vast magnitude. Therefore reading your Paragraph 80, I was a little surprised to find you making a grievance of the fact that the remuneration has not been sufficient to pay you your expenses?

A.—If you will allow me to say so, I should be very sorry if you took that as being a complaint.

Q.—I came to that conclusion on reading it?

A.—It is not a complaint at all; It is simply a statement of facts. There is no complaint at all.

Q.—When you undertook this job it was on the basis of an estimate of three crores and 67 lakhs. That estimate, according to your own report, was based upon substantially reliable data, and you said you never over-estimated an estimate.

A.—Yes.

Q.—Evidently, therefore, when this job was undertaken by you, you calculated that your gross commission was going to amount to about 6 or 7 lakhs—taking 1 per cent. on the dredgers?

A.—Yes.

Q.—You have practically been paid that remuneration, although not even 25 per cent. of the work has been done. Therefore, if this is in the nature of a complaint, I say the complaint is hardly justified, because you have been already paid the full amount of the remuneration which you originally anticipated, although not even 25 per cent. of the work has been done?

A.—As I said before you made your last remark, it is not a complaint.

Chairman.—I do not read it in any sense as a complaint. It is a statement of fact that, in fact, although you got the large sum of £45,000, against it you have to set off large numbers of expenses, journeys to India of yourself and other people, and in the result in some instances it has not proved remunerative. It is not a complaint at all.

Mr. Billimoria.—I am very glad to hear you do not make any grievance or complaint about it, but the people in Bombay will make serious complaint of it, because you have already been paid a sum of 6 lakhs for work which they anticipated you to complete for that remuneration, and they do not see anything approaching 25 per cent. of that work. That means they have to pay four times over if the scheme is to be completed. That is their grievance. Supposing, Sir George, when you submitted your report and estimate to Government, some officer in the department, either in the Public Works or in the Secretariat, had suggested that before any administrative sanction could be obtained it was desired to consider carefully your report, you would most willingly have given that officer all the information in your possession, I take it—if he wanted information or assistance from you?

A.—You mean, for example, Sir Sydney Crookshank?

Q.—Yes.

A.—Certainly. It would be my duty to give that information.

Q.—You would place before him all the necessary materials and data upon which you arrived at your various conclusions, without the slightest hesitation?

A.—Without the slightest hesitation.

Q.—You would have been very pleased to have discussed any points arising out of your report and out of these details?

A.—Yes.

Q.—I am very glad you admit it, because I find that your learned Counsel the other day raised the objection that we were not entitled to the details. Therefore your last few answers dispose of that objection. You say that any officer of Government had the right to demand from you particulars, and that you would very willingly have furnished them. Therefore this Committee is entitled to ask for those details from you, acting, as it now is, in the spirit of an Enquiry to gather all these details from you?

A.—Do not misunderstand me. I should be very sorry for you to think that I was not anxious to furnish everything to this Committee. This particular case raises a little bit of professional etiquette. An engineer does not usually publish all his calculations, and so on. It was not with any idea of keeping anything from you.

Mr. Billimoria.—I am very glad to hear that, because there was a passage at arms between myself and your Counsel when, on one day, he got up and said that the newspapers had reported something of mine to which he took exception.

Sir H. Courthorpe-Munroe.—I did not desire to cross swords with you. I think I made my position in the matter clear to the Committee.

Mr. Billimoria.—Your visits to Bombay in different years, Sir George, were not exclusively in connection with the reclamation work. Along with your visits to Bombay there were other visits to Baroda and other places in India and elsewhere. Therefore

you cannot say that all your visits were simply in connection with the reclamation scheme at Bombay?

A.—Not absolutely. The Secretary has the list of my visits.

Q.—He has, and from that list I find that you very often went to Baroda, and you enjoyed your Christmas holidays in Calcutta, and you had many other pleasant trips all over India?

A.—That is a very nice way of putting it.

Q.—So that the time you spent in connection with your various visits to India was not exclusively devoted to the reclamation work?

A.—No.

Q.—I will now direct your attention to the letter written by H.E. Lord Lloyd on the 25th May, 1919, and request you to turn to Page 29 of your statement. You remember the letter which was read out to you by the Chairman?

A.—Yes.

Q.—In Paragraph 34 you say : " If I said the scheme was impracticable he would turn it down at once and start on something fresh, but once my opinion was given he would refuse to allow any other expert to report, and he asked me not to let him down ". This is in reference to an interview between yourself and the Governor of Bombay?

A.—Yes.

Q.—At the interview Lord Lloyd asked you not to let him down?

A.—Yes.

Q.—You have been good enough to explain to the Chairman what that means. What I want to get from you is this—that Lord Lloyd depended entirely upon your skill and ability to carry out the project, and had very great confidence in you?

A.—Yes, and I think he still has that confidence—at least I hope so.

Q.—I am very glad to hear that. He said so when he was giving evidence here. If you remember, that letter speaks of the financial aspects besides the engineering aspects; and you will agree with me that all engineering propositions are very closely linked up with finance?

A.—Yes.

Q.—Some schemes may appear very glorious on paper from an engineering point of view, but from the financial point of view they may not be so promising. If they are not promising or financially sound, there would be considerable hesitation before embarking on such schemes or projects?

A.—I absolutely agree with you.

Q.—Your report of 1919, and the estimates, were the foundation for giving birth to the present reclamation scheme?

A.—Yes.

Q.—The whole scheme is based on that report of yours of September, 1919?

A.—Yes.

Q.—If those estimates had been exceeded in a measure so as to make the scheme a financial failure, as pointed out by the Government of Bombay, it would mean that you have let down the Government. Do you agree with that?

A.—No, I would not agree that I had let down the Government at all.

Q.—The scheme was launched on the basis of your 367 lakh figure. If that estimate is three times as much now, would not you call it letting down your employer?

A.—No. If you ask me whether I have let down Lord Lloyd, I say no I have not, and some day, I hope, when this is all over, he will express his opinion upon the matter. You know as well as I do of the extraordinary optimism there was in Bombay. Even when the 702 lakh estimate was sanctioned they expected to get 369 lakhs of rupees profit.

Q.—Circumstances have altered since then?

A.—Circumstances have altered since then.

Q.—What I am driving at is this—that Lord Lloyd had implicit confidence in you?

A.—Yes.

Q.—He said he would not go and consult any other civil engineer but would rely on you absolutely. The whole scheme was launched, recommended and approved by the Government of India and the Secretary of State on the basis of the figure of 367 lakhs?

A.—Yes.

Q.—Now that that figure is three times as much do not you think it is letting down the Government?

A.—No. If you could prove that I was entirely responsible for the figure increasing to the extent that it has, it would be a very grave error of judgment on my part, but I

would like to try to make you believe that this plan and these estimates were made in good faith, with all the knowledge that I could get on the subject; and I still say that they were reliable in 1919. As I have said this afternoon, I am perfectly willing to let a board of impartial Westminister engineers express an opinion on that report and on those estimates.

Q.—You will agree with me that in the light of events that have transpired, this was rather a hurried report; that you did not give it as much thought and consideration as you might have done under normal conditions?

A.—Mr. Billimoria, I should like to agree with you, but I cannot accept that. I consider I gave it all the care, consideration and time that was wanted. If I may make an analogy, probably you are very quick indeed at making an audit. Supposing you make an audit and you take half the time which a less skilled professional man would take, you would not say that you had made an inaccurate audit:

Q.—True, but if I had overlooked something very material, I should be hauled up in a Court of Law by the Learned Counsel who is appearing for you, and I should be sent to penal servitude for seven years if I let down the shareholders of the Company.

A.—I consider that I remained long enough in Bombay to get all the information that I wanted. Then I went home and spent the whole time I was at home considering this report, along with a very skilled engineer indeed—the late Mr. Meik, an engineer quoted by the Government of Bombay as being in the very first rank of harbour engineers. It was five or six months between the time I took on this work and the time before it was finished.

Q.—Do you think your ten days' stay in Bombay was sufficient to gather all the information necessary for a scheme of this vast magnitude—perhaps the biggest in the world?

A.—Honestly I do, Mr. Billimoria.

Q.—Ten days was sufficient for you to gather all the data and information?

A.—It would not have been if I had been doing it as a contractor, but I was not. I was not doing it as a contractor would have done it. I had not to go and work out all the details on the spot of constructing the quarry. This was not a detailed report. This was a report upon Mr. Kidd's report. This was in no sense a working document. This was not a document with which you could have gone to a contractor and said: "Will you take the work on this?" In fact in the correspondence I have stated that the first thing to do after the administrative sanction to the scheme was passed was to get out the detailed working plans and estimates.

Q.—Your responsibility with regard to that report was very much greater than that of a contractor, Sir George, because it was on the basis of your report that the Government embarked on the scheme. Had you stated something otherwise in your report—had you expressed the slightest doubt that the scheme was not feasible, or that it was not financially sound, Lord Lloyd, as stated in his letter, would have directed his attention to something more serious, and would have abandoned the scheme altogether. So that there was a greater responsibility on your shoulders than there would have been on the shoulders of a contractor, who would simply have burned his fingers if he had gone on that estimate.

A.—If you will excuse me, it was no business of mine to report on the financial prospects of the scheme.

Mr. Billimoria.—The letter indicates that, "both financially and otherwise," as to whether it is a sound proposition.

Chairman.—The letter says "on the present prevailing prices."

Mr. Billimoria.—If it is on the present prevailing prices that indicates the same thing.

A.—I do not follow you.

Chairman.—In Lord Lloyd's letter of 23rd May he put before you two things. He wanted to be advised as to the feasibility of the scheme and whether, in view of the greatly enhanced prices of dredgers, the plan was a workable one.

A.—I understand exactly; but I understood Mr. Billimoria was suggesting that I should have assisted in discussing the ultimate financial success of the scheme.

Chairman.—Lord Lloyd never put that to you.

Mr. Billimoria.—Not the ultimate success; but in any scheme that is launched, if the cost is so much and the Government contemplated if they were going to get a return of so much it would be a financial success, then financial considerations come in?

A.—Yes.

Q.—If your report had stated 702 lakhs, and the Government contemplated it was not possible to recoup 702 lakhs, they would have given up the scheme as a financial failure. That is where the financial aspect comes in.

A.—In point of fact, would they?

Sir Frederick Hopkinson.—You mean that the ultimate result is affected by the cost?

Mr. Billimoria.—It must be so.

Chairman.—Mr. Billimoria's point is even shorter than that. He say, if Sir George Buchanan had stated at the outset 702 lakhs for the cost of the execution of the work, the Government might possibly have turned it down. Sir George Buchanan says: would they, in the prevailing spirit of optimism?

Mr. Billimoria.—If you will kindly return to your own report, you find that the Government of India was very, very cautious. They said: "Nobody had previous experience of reclamation on an open sea front."

A.—The Government of India were certainly very cautious, indeed.

Mr. Billimoria.—They would not have listened to anything at a figure of 702 lakhs. It is most unfortunate that things have turned out otherwise, but if Sir George's figure had been 702 lakhs there are grave doubts whether the Government of India and the Secretary of State would ever have sanctioned the scheme.

Chairman.—We must be a little careful about that because Sir Sydney Crookshank, when the point was put to him, said: "I am not at all prepared to say that I would have turned it down."

Mr. Billimoria.—I will put it in a different way. Leaving out the dredging proposition, if it had been an ordinary moorum filling proposition it would have cost 702 lakhs. If it was an ordinary dry filling proposition, and not wet filling, according to my learned colleague's figures it would have cost 702 lakhs, or perhaps a little less.

A.—I can hardly express an opinion about that.

Mr. Billimoria.—My friend has worked out the figures, and that is what he tells me.

Sir M. Visvesvaraya.—I think both of us are agreed as to that.

Mr. Billimoria.—So that the Government of India could never have entertained the proposal of dry filling at a cost of 702 lakhs. That is one of the reasons why I say the Government would have turned it down.

A.—Yes.

Q.—You know the area to be reclaimed is 1,145 acres?

A.—Yes.

Q.—Out of that only 22 lakhs of square yards of land were to be made available for building sites after providing for roads and open spaces?

A.—Yes.

Q.—If you will kindly turn to your statement at page 16, you will find there is a forecast in the middle of the page: "The Bombay Government anticipate carrying out the work in eight years, and the forecast is based upon that assumption and the leasing out of an area of 60,000 square yards per annum commencing with the seventh year on the basis of 60,000 square yards of leasing per annum." If you have 60,000 square yards per year; that is to say, available for leasing out, it would have taken 36 years to dispose of the entire area of 22 lakhs of square yards?

A.—Yes.

Q.—Thirty-six years is too long a period.

A.—That is a quotation from a letter of Mr. R. P. Russell.

Q.—He had gone into the scheme very carefully. He had considered the previous projects very carefully. Did you consider that aspect of the case, as to how many years it would take to sell the land?

A.—No; I did not. That was not within my province.

Q.—Were you told anything about it, or consulted?

A.—No; I was never asked a single question.

Q.—You have in your memorandum at various places made references to Committees appointed by the Government. I need not draw your attention to any particular passages, but in various places you have referred to that?

A.—Yes.

Q.—Did you at any time see the report of the Bombay Development Committee, published in 1914? (*Book handed to the Witness.*) Was that volume ever brought to your notice?

A.—I seem to recognise it, but I do not think I have read it.

Q.—Do you know the opinion that was given by Messrs. Jacob and Davies, the American engineers who had reported on the scheme?

A.—No.

Q.—It is page 185.

A.—No; I never saw their opinion.

Q.—I shall be obliged if you will kindly turn to page 185. It is a letter written by Messrs. Jacob & Davies, engineers, dated 21st March, 1911, to Ratan Tata, Esq. In paragraph 4, the last sentence is : " In our opinion this huge scheme is unnecessary and chimerical to the last degree. All this is entirely beside the question of whether the work can be done for the sum estimated by the Government engineers, which from the data collected on the ground last year by our representative, we consider is in the highest degree improbable, and we may even say, impossible." This is the opinion of very eminent engineers expressed in 1911?

A.—Yes.

Q.—Then later on they say : " We think that Government has got hold of the reclamation idea and has run it to death, without fully balancing in all their aspects what benefits and what harm will accrue to the city by this gigantic piece of meddling with the natural situation." Then if you will kindly turn to page 188, paragraph 8 of the same book, the same engineers express this opinion : " While we consider the Government cost figures as impossible on such a scheme as we deem proper and sufficient, they none the less had 13,000 borings from which to judge of the nature and quantity of the material available." Then at page 189 they say : " It goes without saying we gave you the best possible advice, not only with regard to yourself, but presumably with regard to the investing public, and stated we believe that the pressure on the available area of Bombay did not warrant any such scheme of reclamation, the return from which would seem to be highly doubtful, to put the case mildly. If the Government is willing to tax the people in favour of such a scheme, the matter assumes an entirely different aspect and puts a burden upon the public." Then at page 193, in paragraph 12 (*b*), at the middle of the page, he says : " As I have said before, both in the report and in letters to you, I cannot, for the life of me, see the slightest call for all this immense reclamation. Bombay has plenty of available area (except in the Native town) ; its population density," and so on. Then he says : " Any scheme of reclamation cannot be financially productive for many years (calculated at 31 years, I believe) "—according to that forecast it would be 36 years— " even at the low cost of reclamation which the Government arrives at, and even on the assumption that considerable blocks of land are taken up at rates of Rs. 25 per square yard per annum every year, while the reclamation process is still going on. This, I believe, is a far-fetched assumption, and not likely to be realised." Then I would draw your attention to these last few lines : " I should think that the Government would, or should, hesitate considerably before embarking on such a scheme, to find that the cost were higher than estimated or allowed for, which I believe would inevitably be the case, and finally to be compelled to leave it partly done, or have it drag on over much more time than was expected, or would not have the land taken up in the quantities or at the rates assumed, would be a disastrous affair for a town like Bombay." These gentlemen have turned out to be the real prophets.

A.—" I believe still that the place is ' reclamation crazy,' if I may use the term."

Q.—If you read the paragraph further on, he says : " My figure seemingly comes to over twice that of the Government, and my figure has large allowances which they may not have taken into account, for all that I know." The figure of the Government is evidently Mr. Kidd's. Then he says : Mr. Tata, I believe, will live to congratulate himself on having been persuaded from going into this thing, if the project ever comes off." Then on page 194 he says, in the last paragraph but one : " However, even in my over much more time than was expected, or would not have the land taken up in the Government's, and their estimates I can only look upon as optimistic."

A.—Yes.

Q.—What you have done is, you have taken a figure far below Mr. Kidd's figure, and yet here are these eminent American engineers who say that Mr. Kidd's figures are far too low. Can you give us any explanation as against the opinion expressed by these eminent engineers of America, who have eventually turned out to be trus prophets, as far as this scheme is concerned?

A.—No, I cannot. Who is Mr. Hewett?

Mr. Billimoria.—He is a partner in that firm evidently of Jacob & Davies, as you will see from the correspondence.

Chairman.—Was that letter addressed to the Tatas?

Mr. Billimoria.—Yes. It was submitted to the Committee and embodied in the report of the Bombay Development Committee of 1914.

Chairman.—That letter addressed to the Tatas must have fallen on very deaf ears, because, as we know, in December, 1917, the Tatas were crying out for a concession to do this very reclamation by dredged filling.

Mr. Billimoria.—We have heard a lot about that, but we do not know on what principle that was, or on what basis of figures the Tatas were prepared to do it. There is nothing before us. There is nothing to indicate that the Tatas were prepared to do it for 367 lakhs.

Chairman.—No.

Witness.—No, but they were prepared to do it. They were prepared to take on the work.

Mr. Billimoria.—Yes; but at what figure we have no evidence before us.

A.—I think that report is very interesting.

Q.—I am very glad that you find it interesting. What opinion have you to express about it?

A.—I do not know what data they had.

Q.—When you estimated you considered Mr. Kidd's figures were excessive. Messrs. Jacob & Davies find they are far too low—it ought to be twice as much. That is going back to 1911 or 1913?

A.—Yes.

Q.—Prices had advanced, as you have admitted, two-and-a-half times; so that if these figures are low, your estimate should have been at least $2\frac{1}{2}$ times as much, and not at the figure of 367 lakhs?

A.—Well, I do not know the data on which these people expressed their opinion, but I have given very freely the reasons I had in preparing my estimate.

Q.—Will you kindly return to your report at page 6: "The Government of Bombay are satisfied that Mr. Kidd's figures may be accepted with safety, as a sufficiently close approximation to the cost of the work to justify further investigation of the scheme." Then: "The Governor in Council has closely examined the figures, and is convinced that they have been drawn up with due care and are sufficient for the immediate purpose in view, and as such deserve detailed investigation." The Government therefore relied very much on the figures of Mr. Kidd, and did not consider them excessive. If you will kindly turn to page 7 of your report, you will find in paragraph 21 they say: "The investigation had been most carefully made, and might be accepted as exhaustive, the report was clear and complete, all doubtful points had been settled, and the revised estimate might be accepted as completely trustworthy and ample." So that the Government had ample confidence in Mr. Kidd's figures. Then in paragraph 24 of your report, it says: "The Government of India were, however, still unconvinced and expressed the opinion that a strong representative Committee should be invoked." Then at page 9 you stated that you did not agree with certain figures of Mr. Kidd, and that you had to go into the matter *ab initio* and prepare your own designs and estimates?

A.—Yes.

Q.—If the Government experts in various Departments, with experience at their back for a number of years, found that Mr. Kidd's figures were reliable, and if the independent experts, Messrs. Jacob & Davies, found that the figures were low, how were you tempted to believe that Mr. Kidd's figures were excessive?

A.—I do not know anything about the experts from America, I have not got their data, but really it would be very interesting to ascertain precisely to what extent the Government of Bombay did examine Mr. Kidd's figures.

Q.—As you will find from the corespondence between the Government of Bombay and the Government of India, when the figures were submitted, the Government of Bombay expressed the opinion that they had been thoroughly scrutinised and looked into by the Department of Government, and they relied on those figures?

A.—Yes.

Q.—Therefore, ordinarily one would take it that those figures were not excessive. If they were excessive, the Government Engineers would have pointed out that they were wrong and that they were excessive; but on the contrary they say they are trustworthy, thoroughly reliable, amply justified, and so on?

A.—With all due deference, I do not think that the officials of Government would ever say that an estimate was excessive.

Q.—They would not say that?

A.—I do not think they would say it was excessive.

Q.—They have not said it was excessive?

A.—I do not think that they would. They would not say that the estimate was excessive. I think you must consider in what spirit the Government of Bombay looked at the scheme. We know that a previous Governor, Lord Sydenham, was very keen indeed on getting his scheme through.

Q.—I will tell you why the Government of Bombay should have considered, if there was anything in it, that they were excessive, because at that time the Government of Bombay did not contemplate doing the work departmentally. It was to be done by a firm of contractors. The Government would not feel that 50 per cent. profit should go to the pockets of the Directors at the expense of the poor tax-payers of the City of Bombay. They would reasonably allow a certain margin for people who would come forward and undertake the job, but they would certainly not allow a private profiteer to come and put in his pocket 50 per cent. of 325 lakhs. Surely if you were there in the Government, you would put your foot down against any such proposal?

A.—I certainly should.

Q.—In the course of your evidence in reply to the Chairman, you have stated that the Government were inconsistent. I think you made that remark. I suggest that the Government were very prudent when they decided to have the scheme thoroughly examined by the best expert available before embarking on the scheme? If you would kindly turn to page 6 of your report, the letter from the Government dated the 6th December says that there was enough " to justify the further investigation of the scheme." So that they were not at all inconsistent when they employed an expert like your good self to advise the Government whether they should embark on the scheme or not? That was not an inconsistency at all?

A.—I cannot remember the remark that I made to the Chairman about there being an inconsistency.

Chairman.—I think I can tell you what it was. You pointed out that at one moment the Government had apparently regarded the report of Mr. Kidd as final and conclusive, settling every matter, and then there was a letter later on saying : " We have always recognised that we should have, before deciding this matter, to employ an independent expert." You are quite right in pointing out that there was an inconsistency there.

A.—Yes.

Q.—At one time they were saying that they regarded Mr. Kidd's report as final, satisfactory, complete and conclusive?

A.—Yes.

Q.—Then two or three years later they are saying : " We have always recognised that, before embarking on the scheme, we should have to take the opinion of an independent expert."

A.—Yes.

Q.—That was the point.

A.—Yes.

Mr. Billimoria.—I would rather not call it an inconsistency, but I would rather flatter the Government of Bombay, and say they were very prudent. They were very careful before embarking on the scheme to have another expert's advice; they were prudent, and not inconsistent.

Chairman.—They may have been inconsistent in a sensible way?

A.—Yes.

Q.—But it was not inconsistent. It does not follow that it was not prudent to do it.

A.—A prudent inconsistency, you may say.

Chairman.—You can have both.

Mr. Billimoria.—In the course of your evidence you have referred to the trials of the dredger on the Clyde. Do you suggest that the material in the Clyde is the same as the material that you find in Bombay Harbour?

A.—No.

Q.—The clay which you find in the Clyde is not the same as that in Bombay harbour?

A.—I have not any personal knowledge of it, but I should not say it was the same.

Q.—If it was the same do you think it was prudent or safe for an engineer of your repute to have placed an order with dredger builders which involved a test on the Clyde with material which you did not know about? What was the value of that test?

A.—If I may say so, I think really that question would be more suitably addressed to Sir John Biles, because he drew up the specification, and he arranged for the test. But I think you will find it is a very ordinary test. As I said this morning to Sir Frederick Hopkinson, this is not the only suction pump dredger that has been made, and I suppose there have been dozens and dozens of dredgers tested on the Clyde. Certainly I have had personal connection with 7 or 8 dredgers that were tested on the Clyde, in the same way that these dredgers were tested, and there has never been any complaint at all.

Sir Frederick Hopkinson.—It all depends what they have to do——how you test them, does it not?

A.—Yes.

Mr. Billimoria.—Was the material similar? It may be that the material in other harbours was infinitely better than what it was in the Clyde, so that the test would be a reasonable test?

A.—No; it was very similar material to the material at Bombay—clay and silt.

Sir M. Visvesvaraya.—They were suction dredgers, I suppose?

A.—Yes. The Calcutta Port Commission have got a lot of very powerful suction dredgers on the Hooghly, and I very often used to go there and inspect. The extraordinary thing is that of the numerous suction dredgers that have been built in the course of the last 20 or 30 years, this is the only case where there has been a charge of definite failure against the dredger.

Mr. Billimoria.—We will leave it at that. I take it that you kept diaries for all these years since you have given us so many details and dates of your various visits to Bombay, and so on? Could you produce any note from your diary with reference to your interviews with Mr. Messent in 1919 in connection with this scheme, when you were in Bombay in 1919?

A.—No, I do not think I can produce any note. In my private diaries I have merely made very short records.

Q.—If you had interviews with Mr. Messent I suppose they would be recorded in your diary?

A.—No, I do not think so. You must remember that I had known Mr. Messent for 30 years, and I frequently used to have dinner with him when I was in Bombay.

Q.—This was all after dinner conversation?

A.—Well, I think you probably will agree with me that most of the business in Bombay is done in after dinner conversations.

Sir Frederick Hopkinson.—Does not that account for the Bombay Back Bay reclamation works, because it looks very much like after dinner work?

A.—Or after lunch. He was a very great friend of mine, and I saw him as one does see an intimate friend—I probably saw him every day.

Mr. Billimoria.—I ask you that question because you have laid so much emphasis upon the information that was given to you by Mr. Messent. Undoubtedly Mr. Messent had a very great reputation in Bombay connected with the Bombay Port Trust, and one would look upon his view with a certain amount of weight and confidence.

A.—Mr. Messent and myself were boys together on large harbour works in the north of England, and therefore he was a very great friend of mine for the last 30 years. Whenever I have been in Bombay I would always go and see him, so that one did not have to go and write him official letters and say " Will you give me this information, or that information? "

Q.—It is very unfortunate so far as this Committee is concerned that Mr. Messent is dead and gone, otherwise we would have had some very interesting facts as to how he arrived at this data and how he communicated this data in conversation to you. You were employed as a technical independent expert by the Government to advise them on the feasibility of the scheme from an engineering point of view. Did any member of the Government or the Governor of Bombay or any officer at any time ask you to rely on Mr. Kidd's borings.

A.—No, certainly no one asked me to rely on Mr. Kidd's borings.

Q.—You were called upon to submit an independent opinion?

A.—Yes.

Q.—If you turn to the terms of reference there is no suggestion whatever that you had to depend upon Mr. Kidd's borings or anything of the kind?

A.—No, there would not be, but if you look at page 21 in my statement you will see a telegram from Lord Lloyd stating " My Government are desirous of securing your services at once. All plans and data are here."

Q.—That does not give any indication that you had to rely upon that data. Looking to the terms of reference as stated, page 1 of your report, the specific points on which your opinion was required, was: " The practicability of the scheme from the engineering point of view. (2) The suitability of the type of wall proposed, or alternate suggestions for better types. (3) The suitability of the proposed method of reclamation by means of dredging, or alternative proposals for same."

A.—Yes.

Q.—There is no indication that you had to rely on Mr. Kidd's borings or upon any of the past figures or data, but you were called in as a special expert, and Lord Lloyd made it perfectly clear that he would depend on your advice. If you turn to

page 9 of your report it gives the impression to anyone reading it that you had prepared this report quite independently of Mr. Kidd, because on certain points you differ from Mr. Kidd, and you say : " Under those circumstances I have had to go into the matter *ab initio* and prepare my own designs and estimates."

A.—Yes; that is true.

Q.—" There can be no doubt that for the following reasons the scheme is practicable." You are expressing there a very definite opinion?

A.—Yes.

Q.—Any layman or man in the street reading this report would come to the natural conclusion that your report was based upon a thoroughly independent careful investigation and examination?

A.—If you turn to page 11 of my report you will see I say : " On the assumption that Mr. Kidd's surveys and borings are correct, and I see no reason to doubt their accuracy, as a great many borings were taken, I accept his conclusion both in respect to quality and quantity of material."

Q.—That is true.

A.—I still maintain that I have never had anything to do with a project where there has been a more complete and systematic investigation by borings than by Mr. Kidd. In my letter on page 29 of my statement of the 29th May I wrote to the Joint Secretary of the Government of Bombay and the Public Works Department, and said : " I have examined the site on several occasions, and have satisfied myself that the survey and borings made by Mr. Kidd are sufficient to enable me to write my report."

Q.—That gives an impression that you have made some sort of independent investigation?

A.—In my examination by the Chairman I think that came up, and we agreed that " I have examined the site on several occasions " did not mean that I had taken any borings, but that I had gone over the ground and had satisfied myself that the survey and borings made by Mr. Kidd were sufficient to enable me to write my report. I had to report on Mr. Kidd's scheme, and I still say that Mr. Kidd's survey and Mr. Kidd's borings were sufficient. After all; Mr. Kidd's borings and Mr. Kidd's plans and Mr. Kidd's scheme had been sent to the Government of India by the Government of Bombay, with an expression of opinion that they were absolutely complete in every respect. and could be accepted with confidence.

Q.—So that any assumption with regard to the reliability of Mr. Kidd's borings was made on your own responsibility. No suggestion was ever made by any officer of the Government that you should rely upon them. If you relied on them it was on your own responsibility?

A.—I accept all the responsibility for relying on Mr. Kidd's borings.

Q.—Sir Frederick Hopkinson having taken you through the various figures of the comparative estimate, I need not trouble you about it, because he has already anticipated my questions, and I shall only ask you one question regarding it. Taking the cost of the sea wall alone, Mr. Kidd estimated 64 lakhs, and you in 1919 increased it to 118 lakhs?

A.—Yes.

Q.—In 1922 you increased your own figure to 200 lakhs, and the Chief Engineer in his project estimate increased it to 235 lakhs?

A.—Yes.

Q.—So that your figure of the sea wall was more than three times Mr. Kidd's figures?

A.—Yes.

Mr. Billimoria.—In spite of that, in your note you say that you have made a considerable saving on the sea wall. The dimensions of the wall were considerably increased, but the expenditure, on the contrary, has gone up. How do you reconcile that?

Chairman.—It is a considerable saving upon a section of the sea wall?

A.—Yes, and alteration in the design.

Mr. Billimoria.—The sea wall was reduced both as regards the weight and height?

A.—Yes.

Q.—But the expenditure has been twice your original figure, and three times Mr. Kidd's figure?

A.—Yes.

Q.—Have you any explanation with regard to why that figure has gone so high?

A.—I think a great deal too much money has been spent on the sea wall.

Q.—By whom?

A.—By the Development Directorate.

Q.—Had you no control over that?

A.—Absolutely none.

Q.—Why did not you put the brake on, saying they were not within the estimated figure? You are there as responsible engineer for the scheme.

A.—I never knew what the work was costing.

Q.—I know you have made a grievance of that.

A.—That is a fact. I could not put the brake on when I had not the faintest idea how much money they were spending.

Q.—Then what did you mean by being " responsible engineer "? In the book of correspondence at various pages you call yourselves " responsible engineers to the Government." What is the meaning of the expression " responsible engineers " if you allow things to drift in the manner they have done? Where do you come in as the responsible engineers?

A.—I think that would be more suitably argued by my Counsel.

Mr. Billimoria.—If your learned Counsel is going to argue that I shall listen to him with great attention.

Sir H. Courthope-Munroe.—That is all I want.

Chairman.—You want something more than that. You wish to carry your audience with you.

Sir H. Courthope-Munroe.—I hope so.

A.—I would just say that there seems to be as many definitions of " responsible engineers " as there are of " unctuous clay."

Mr. Billimoria.—If we had at every stage and every turn to fall back upon the dictionary, I suppose business morals would never exist.

A.—No.

Q.—I would invite your attention to the matter of moorum toppings. I want to refer to page 86 of the book of correspondence and to your report, page 4. In your report you say one foot of moorum toppings is sufficient?

A.—Yes.

Q.—At page 86 of the book of correspondence Mr. Lewis writes to you on the 29th May, 1923: " I am told that the thickness of moorum laid over the harbour dredgings averages something like 6 feet, and rises to 9 feet in places on the Mazagaon reclamation." If you had any conversation with Mr. Messent with regard to this moorum topping, Mr. Messent had experience and had personal knowledge that the moorum required there was 6 feet deep and not 1 foot. How did you come in your report to take the figure of only 1 foot?

A.—But we hoped to get much better stuff than they got in the Sewri reclamation.

Q.—Have you ever been to the Sewri reclamation?

A.—Frequently.

Q.—You must have noticed that the moorum topping is nearly 6 feet deep?

A.—Yes.

Q.—In many cases it is more than 6 feet.

A.—They began with a great deal less, and they they had to increase it.

Q.—In spite of that experience and knowledge, were you satisfied that only one foot of moorum topping was sufficient for the Back Bay reclamation?

A.—Well, the Sewri reclamation was very largely mud. Later they went into blue clay, but the Sewri reclamation is not on a rock foundation. We thought that 1 foot would be enough over the area. There is another point to be remembered. A great deal can be said about the quantity of moorum. It was decided in consultation with the town planner that it would be extravagant to put a foot of moorum over the entire area; and that the moorum should be confined to the roads, because you would not want to go and put moorum on the site of a house, which would be at once dug up for the foundations. So that there were several estimates for moorum. After the lay-out was obtained from Mr. Davidge there was another estimate got out for moorum on the supposition that it would only be laid on the roads.

Q.—Were you satisfied at the time when you wrote this report that 1 foot of moorum topping was sufficient?

A.—I was.

Q.—Within a short time thereafter you changed your opinion and made it double the quantity. In your revised estimate you take it at 2 feet deep?

A.—Yes.

Q.—Were there any circumstances, strange or unfamiliar or extraordinary, to make you believe otherwise in 1922 to what you believed in 1919?

A.—That, I think, we discussed when I said Sir Lawless Hepper had asked me to put on an amount for moorum reclamation and equipment.

Q.—May I ask you to direct your attention to page 103 of the book of correspondence? Mr. Lewis says : " That the whole show has busted." I will read the whole of the paragraph : " I would point out that we are by no means sure that the filling from the harbour is going to be of use as a means of reclaiming the area. If it proves unsuitable the fact will become common property about the time the work at Marine Lines will be stopped. What inference is the man in the street to draw?—' That the whole show has busted '." Have you any remarks to offer with regard to those remarks of Mr. Lewis?

A.—No ; I only saw them since this Committee sat. They were not addressed to me.

Q.—You have no knowledge of those?

A.—No; no knowledge of those. They were addressed to his immediate chief, the Director of Development, and I never saw the correspondence between the Director of Development and Mr. Lewis.

Q.—Do you mean to say that such materials facts were kept back from you by the Development Department?.

A.—Well, if you call that letter a material fact, that would never be sent to me.

Q.—It has been suggested that you and Mr. Lewis were not on good terms, practically not on speaking terms. It has been said because Mr. Lewis pointed out various defects in your working that you were hostile to him, and you actually recommended the Government of Bombay that his service should be terminated. Have you any explanation to offer with regard to that? I only say it has been suggested.

A.—Yes ; I think I have made it sufficiently clear in my statements in my examination by the Chairman and others that I have no hostility at all, and never had, against Mr. Lewis. I believe I have spoken very fairly about him indeed in this room. All that I say is that his health broke down absolutely, and that affected him mentally and physically. As to personal hostility, I had none at all. It is quite true that he was in such a peculiar state that he would not see me. I have got a note, which I showed to Sir Lawless Hepper, that the last time but one when I was in Bombay, although I had been several weeks in Bombay, Mr. Lewis had refused to come near me more than two or three times.

Q.—So that I take it you are prepared to repudiate any suggestion made in Bombay that because Mr. Lewis pointed out various defects in your working you were hostile to him?

A.—Most emphatically.

Chairman.—That has not been stated in evidence.

A.—No.

Mr. Billimoria.—That has not been stated in evidence, but that is the suggestion which is made.

Chairman.—I am not taking any notice of anything unless it is in the evidence.

Mr. Billimoria.—Turning to page 12 of your report, you will find in paragraph 37 : " From Mr. Kidd's plan I see he proposes seven pipe lines across the peninsula. I think this number is excessive, and have reduced the number to three." Have you any special reasons for disagreeing with Mr. Kidd?

A.—Yes; I have a number of reasons which will appeal to you very much as a resident of Bombay. One of Mr. Kidd's pipe lines was to go through the heart of Bombay I cannot remember the names of the buildings now, but it was quite impracticable to put a pipe line through there. I think they went past the Majestic Hotel, and through the congested part of Bombay.

Q.—We have heard Mr. Kidd, and Mr. Kidd said that it would be impossible to have this reclaimed with three pipe lines. The scheme could never work with three pipe lines. Do you still disagree with him?

A.—I do ; and I do not see how he was going to put in his seven pipe lines.

Q.—You conclude your statement by observing that the scheme could be brought to a triumphant success. Do not you think that is a very bold statement to make when you are alive to the fact that, as a result of relying on your advice, the Government of Bombay are now placed in a most embarrassing position?

A.—Not for relying on my advice, but for relying on the powers given to the Development Directorate to spend money and carry out the work.

Q.—Do you seriously suggest that if there was no Development Department and you were the responsible engineer in charge, you would have carried out this project for 367 lakhs and completed it? Is that what you are seriously suggesting?

A.—No ; I do not. Though Sir Frederick Hopkinson disagreed with me, I say that prices very materially increased between 1919 and 1922, and to-day the prices of labour in Bombay are considerably higher than they were in 1919.

Sir Frederick Hopkinson.—They are only double pre-war prices to-day.

Mr. Billimoria.—The scheme which was expected on a modest estimate to provide a profit of 30 crores will, on a careful consideration of all the circumstances as now ascertained close with a loss of 13 or 14 crores. Would you still call that scheme a triumphant success?

A.—Why should you say it will close with a loss of 13 crores?

Q.—That is the opinion of the Government of Bombay on the subject, expressed in their letter. You are fully aware of this correspondence, I take it?

A.—No; I do not think I am.

Q.—If you refer to page 179 of the book of correspondence this is what the Government of Bombay say: "The Government of Bombay undertook the work believing in the reasonable accuracy of Sir George Buchanan's estimate. The result so far has been that the annual output has not been more than 25 per cent. of it, and a careful and prolonged investigation shows that unless substantial improvement can be attained the work will not now be finally completed till 1944, and that assuming that the whole area is sold off by 1952 the scheme will close with a loss of between Rs. 13 and 14 crores. This loss written back to the present day is equal Rs. 3 crores, and Government are confronted with the necessity of writing off this sum. The result, in practice, is that provincial revenues will be burdened for 60 years with an annual payment of Rs. 20 lakhs to cover the interest and sinking fund charges on the anticipated deficit, and provision for the first payment had been made in the budget estimates for 1926-27."

A.—Is that from the Government of Bombay Development Department?

Q.—Yes.

A.—Well, that is practically Sir Lawless Hepper, is not it?

Q.—It is written by the Secretary to the Government.

A.—Yes; he would see the letter. That is the extraordinary situation.

Q.—According to what we now find, the resources of the Presidency are mortgaged for a number of years to come.

A.—I hope without being too optimistic that these figures will not be fulfilled.

Q.—That is not the view of the Government alone, but people within and without the Government have expressed grave doubts on the practicability or feasibility of the scheme ever turning out to be a financial success. Those are the remarks with which I conclude the examination in reference to your observations that the scheme is going to result in a triumphant success, and I thank you for the assistance you have given.

A.—Thank you very much.

Re-Examined by Sir H. Courthope-Munroe.

Sir H. Courthope-Munroe.—Mr. Billimoria has been good enough to refer Sir George to the fact of my appearance here as Counsel, and I hope your answer to him has satisfied him that in the special circumstances you were entitled to appear by Counsel, and I hope Mr. Billimoria will take it from me that I shall do my very best to assist the Committee to arrive at a true determination of the facts.

Mr. Billimoria.—I very much appreciate that and thank you for it.

Sir H. Courthope-Munroe.—May I fill up the remainder of the day, instead of dealing with the big questions, by clearing up some of the matters that have been dealt with this afternoon? It is not often one has an opportunity of travelling back into a large number of matters, and there are certain facts which are fresh in the minds of us all to-day which might be dealt with to-day and cleared out of the way. May I start by getting rid of the vexed question of Mr. Lewis, and once and for all bury it? It has been said that there was an antipathy between you and Mr. Lewis. I think Mr. Billimoria, if I caught him rightly, suggested that at some stage Mr. Lewis took objection to your instructions, or quarrelled with you as to the nature of his orders?

A.—There was a suggestion to that effect in Bombay.

Q.—Let us try to clear it up. Mr. Lewis, when you honesty recommended him to the attention of the Government, was in your view, a good man?

A.—A most excellent man.

Q.—With a good record?

A.—With a very good record. A great deal has been said about Mr. Lewis, and Mr. Lewis, when he appeared before this Committee, was, I understand, obviously in very bad health. I have known Mr. Lewis for a number of years, and I have no hesitation in saying that he was quite one of the ablest men in the Indian Public Works Department. He was the same type of engineer that is carrying out to-day the Sukker Barrage, and other great works in India. He was an excellent type of Indian Public Works Department engineer.

Q.—And had he been in a responsible position and had done good work?

A.—He had been in a responsible position and had done good work.

Q.—Let us dispose of the question of Anno Domini: what was his age when you suggested his taking over this work? Was he an old gentleman down and out, or what were his years?

A.—He appeared to be in robust health, I do not know what his age precisely was.

Chairman.—I should think about 49 to 50.

Sir H. Courthope-Munroe.—That is near enough.

Chairman.—He was just at the end of his service?

A.—He retired at 53, I think.

Sir H. Courthope-Monroe.—You would not say that everybody who had reached 50 years of age ought to be abolished?

A.—No.

Q.—You would not put it quite as high as that?

A.—No.

Q.—Assuming he was a sound man when you recommended him, which was in 1920?

A.—Yes.

Q.—In April, 1922, you had come to the conclusion, which I think you expressed in a letter of the 11th April, 1922, that Mr. Lewis's health had gone. You used the expression that it was a danger for him to continue with the work—that he was dangerous to the work?

A.—Words to that effect.

Q.—He had got to that stage?

A.—He had got to that stage.

Q.—Then on the 12th May you again write—I am epitomising your letter—saying Lewis is not up to the job. Then on the 3rd June, the next month, you complain in a letter that you could not get any information from Lewis, and that he was keeping you in the dark. Then a week after that you write a letter on the 8th June, of which my summary note is: "Lewis must go." That was in 1922?

A.—Yes.

Sir Frederick Hopkinson.—There was one letter which said he was too old.

Sir H. Courthope-Munroe.—I will come to that in a moment. So that he having come on the scene in 1920, in 1922, April, May and June, you write in various stages that the time had come when he was dangerous to the work, and not up to the job, and that Lewis must go?

A.—Yes.

Q.—He did not go. He remained on although you said he was a danger to the work all through 1922, and all through 1923 till August. Then you write on the 30th August, 1923, a letter which I will summarise by saying again, "Lewis must go."

A.—Yes.

Q.—In point of fact the man whom you had stated, in your opinion, was a danger in 1922 did not go till the 12th July, 1924?

A.—Yes.

Q.—So that he was in charge, notwithstanding your complaints, for two years and several months, dealing as responsible engineer with this very important work which, as Sir Frederick Hopkinson has repeatedly said, was the crux of the whole thing. That was notwithstanding your protest?

A.—Yes.

Sir Frederick Hopkinson.—You will realise at this time, in 1922, nothing practical had been done beyond ordering the dredger?

Sir H. Courthope-Munroe.—I am not arguing with you about it. I want to get these facts on the notes. I am reminded that in the final letter which I referred to of the 30th August, 1923, my summary of it saying, "Lewis must go," is not strong enough, because you say in that letter, which appears on page 87 of your statement: "Mr. Lewis no longer possesses our confidence. We believe he has done good work in his time, possibly he is still suffering from bad health or he is too old for the job; he appears to have no grip of the works; there is no co-ordination or planning out ahead, and we are convinced that, in the interest of the work, an immediate change is necessary."

Chairman.—That is right.

A.—"Old" is a relative expression.

Sir H. Courthope-Munroe.—I understand, as to the whole of this business you are going into this because you are bound to do it because, as the Chairman has said, there is no room for sentiment in this case unfortunately in view of what has happened, but the whole thing is very distasteful to you?

A.—Yes.

Q.—You are challenged about it, and you are now endeavouring to point out that for two years and three months you had been preaching the gospel "Lewis must go"?

A.—Yes.

Q.—The answer which is sent by Sir Lawless Hepper is this: "Your letter of the 6th September regarding Lewis' services. Lewis has intimated that he proposes to take eight months' leave due to him next July preparatory to him retiring." So that apparently he was to run on from September to July, and then the matter was to be considered?

A.—Yes.

Q.—He being there meanwhile in this state in charge of this most important work?

A.—Yes.

Q.—"After careful consideration the Government consider it desirable to accept his proposal." So much for that. You told the Committee that you honestly recommended Lewis and that he was a good man, but his health failed him, and when the time came, upwards of two years in fact before he went, you suggested that he should go?

A.—I did. I spoke twice to the Governor of Bombay on the subject. That is on record. There was also a meeting with the Member of Council concerned.

Q.—Do you think it is fair at this stage of the inquiry to charge you with anything that could be laid at Mr. Lewis's door? What more could you have done?

A.—I do not see that I could have done anything more. The Chairman suggested that I might have resigned.

Q.—That is a counsel of perfection. I will venture to deal with that when I address the Committee. You are referring to what the Chairman said about resignation?

A.—Yes.

Q.—Mr. Billimoria put a question to you about Mr. Kidd's figures. Let us just get rid of that once and for all. You have given a reason which in your view is a good reason why you regarded Mr. Kidd's figures as excessive?

A.—I have.

Q.—Will you put it in half a dozen words again, and we will leave it? May I refer to what Lord Lloyd drew attention to in his evidence? There was a clause in the agreement that in the event of there being a saving, there should be an allowance made for it?

A.—Yes.

Q.—Human nature being what it is, you thought naturally the man would be on the safe side, but when you came down actually to bed rock figures you thought they were too much.

A.—I honestly thought they were too much.

Q.—That is the point?

A.—Yes.

Mr. Billimoria.—I am afraid there is a little confusion with regard to that. That was not with regard to the original estimate. That was in connection with the second scheme.

Sir H. Courthope-Munroe.—That is my mistake. I thought that was the point.

Mr. Billimoria.—No; it was with regard to the smaller scheme.

Sir H. Courthope-Munroe.—I beg your pardon.

Chairman.—He said he wanted one-fifth even in the 325 scheme.

Mr. Billimoria.—I do not think so.

Chairman.—We will see about that.

Sir H. Courthope-Munroe.—If you would not mind looking at Lord Lloyd's evidence, the whole thing is put in a nutshell. If we read that we are possessed of all we need say about it, and there is an end of it. This question was put on page 74 of Lord Lloyd's evidence: "If one believes that Mr. Kidd has made a reasonably accurate estimate of 325 lakhs, and had noticed that he had said he was loading the labour with 20 per cent. for possible rises, and that he was loading the price of materials with 20 per cent. for possible rises, and if anybody had thought the matter over and came to the conclusion that Mr. Kidd's estimate was probably an accurate one, ought it not to have occurred to your advisers and, indeed, to you, when you were reading it"—this is the crux of the thing—"that if Mr. Kidd could do it for 325 lakhs Sir George Buchanan could not possibly do it for under 700 lakhs." That is a question and a perfectly clear question, and it is also the question which has been put to Sir George. Lord Lloyd's reply is

this : My reply to that is : no, I do not think so. I think I have apprehended your point rightly. I am not aware how far the items of Sir George Buchanan's estimate have been actually checked with reference to rates for labour and materials prevalent in Bombay in 1919. I can only make a general criticism, which is a layman's observation, and say that in the first instance the estimate of Sir George Buchanan was not accepted at 367 lakhs. You are probably aware of that, are you not? That is not accurate."

Chairman.—We can dispose of this in a moment. Mr. Kidd did in fact in the 325 estimate stipulate for one-fifth of the saving.

Sir H. Courthope-Munroe.—Yes.

Chairman.—It is page 7 of his report : "' The further condition proposed of one-fifth from any savings effected would make it in our interest, as well as that of the Government, to attain the most economical result."

Sir Frederick Hopkinson.—It is a very common stipulation.

Mr. Billimoria.—But that is the alternative.

Chairman.— That is the actual text of Mr. Kidd's report of 1912.

Sir Frederick Hopkinson.—It is a common stipulation, and a very good one.

Sir H. Courthorpe-Munroe.—When your figure came out to be under his, the reason right or wrong was that you thought the figure he put a tall figure, or a little bit more than you thought it would work out to be?

A.—Yes.

Q.—You thought on that there would be something on which that one-fifth rebate would be payable?

A.—Yes.

Q.—Mr. Billimoria also referred to a matter which I think you have very much at heart, and that is the fact that Lord Lloyd placed implicit confidence in you?

A.—Yes.

Q.—I think you hope that you still deserve it?

A.—Certainly I hope so.

Q.—So far as you know, have you done anything not to deserve it?

A.—No, I do not see that I have done anything to deserve losing his confidence.

Q.—You have repeatedly said that you were not called upon to advise the Government of India upon the financial side of the scheme?

A.—That is so.

Q.—What you were asked to do was, to advise as to the practicability of the scheme?

A.—Yes.

Q.—In a broad sense finance is involved in that; but the finance of the matter was for the Government to consider?

A.—Absolutely.

Q.—In dealing with a vast and important country like India, there may be many things which would be most advantageous to the country that might at the moment be bad from the mere financial point of view?

A.—Yes.

Q.—But your view, which you have expressed to the Committee, is that in the long run Lord Lloyd's views will prove right, and that when this is completed, in the end it will be a big thing and a good thing for India?

A.—In the long run I certainly hope that it will prove a success, and that Mr. Billimoria will live to see it.

Q.—We hope so. Then Mr. Billimoria tried to draw you along the slippery path of giving the date when the work would be completed. You could not do that; but I suppose as a matter of fact if this matter is put out to, I will not say world competition, but put out to the big contractors to deal with, you will get a fair opinion as to when the work can be completed—if the matter is offered to contract, with the time limit, and the views of the contractors are taken?

A.—At the present moment I have ceased to have anything to do with the work.

Q.—Let us hope that is only a temporary matter.

A.—When things have settled down and the matter has been taken away from the Development Directorate and possibly given to contract, I am confident that there will be an enormous change.

Q.—It has been said that although this thing is a failure and all wrong financially, substantially the trouble has been over the cost of dredging?

A.—Entirely.

Q.—You say entirely; I was going to ask you whether there may be other things, but that is the big thing. The big thing that has caused all the trouble is that the cost of the dredging has simply run away with everything. I think I can certainly say that. I do not think anyone will disagree with that.

A.—No.

Chairman.—There is also the long length of sea-wall, which has cost 200 lakhs, which is now lying idle, and interest on which is being lost each day.

Sir H. Courthope-Munroe.—Yes.

Sir Frederick Hopkinson.—It is not only the cost, but it is the failure of the dredgers to do the work in the time.

Sir H. Courthope-Munroe.—Yes. I am coming to that. This is the big thing. The failure of the dredging may be owing to your having useless plant, or faulty plant, or inadequate plant; or it may be due to what you repeatedly have referred to as the "human element".

A.—Yes.

Q.—Rightly or wrongly, you think that it is the human element?

A.—I do. I think that it is the human element.

Q.—You still think, and you have said so to this Committee, that notwithstanding all you have heard about the comments that have been made, and all the evidence that has been given, that this dredger is right?

A.—I do.

Q.—And you would order it again, if you had to do similar work?

A.—Certainly, I should order the same type of dredger.

Q.—I think I am right in saying that you do not stand alone in that view. A witness, Mr. Speirs, who was called in Bombay, agrees with you, and Mr. Kidd approves of the cutter. Mr. Elgee also says that the cutter did its work. Mr. Brims admits that it is possible to get 2,000 yards an hour out of it?

A.—Brims admits that he has got 2,000 yards.

Q.—Mr. McMurray says that the dredger did in fact 75 per cent. of what it was to do in the Clyde. I will meet the point about the Clyde in a minute.

A.—Yes.

Q.—Whether you are right or wrong, do you stand alone in your opinion?

A.—No.

Q.—You have five or six people who take the same view?

A.—Yes; and Sir Henry Lawrence gave a very favourable opinion.

Q.—Sir Henry Lawrence added the valuable point in his evidence that the crew of the dredger had actually to be got rid of and replaced?

A.—Yes.

Q.—That rather points to the human element again?

A.—Yes.

Chairman.—You must not enlist Mr. Kidd amongst your supporters. He may have approved of the particular type of rotary cutter, but he disapproved of the inadequacy of the horse-power, which is very important.

Sir H. Courthope-Munroe.—One labours under a disadvantage in this case where one comes in really on the 30th or 40th day, and one has to pick out on the Shorthand Notes the various points; and I rather gathered that Mr. Kidd had approved of the cutter.

Chairman.—That is right: but when it turned out that the "Sir George Lloyd" was stated to be of 3,500 horse- power pumping, he held his hands up and said: "Your difficulties are explained".

Sir H. Courthope-Munroe.—You have had the advantage of seeing him, and I quite accept that. It is rather important, on this very big question, at some early stage that we should put before the Committee your view and Lord Lloyd's view, and the view that one can gather from the whole of the scheme, as to what in fact your duties were.

A.—Yes.

Q.—We will try to do it to-morrow. Your case is that the whole of the man-handling of this dredger was in the hands of the gentleman who was called the "Chief Engineer," but who was in your document called the "Resident Engineer," Mr. Lewis?

A.—Yes.

Q.—As to whom for two years and three months you were the voice crying in the wilderness to get rid of him. He was the man who had the handling of this?

A.—He and his staff.

Chairman.—He should have been the driving force behind the whole concern?

Sir H. Courthope-Munroe.—That is it—the driving force, acting under Sir Lawless Hepper, whom Lord Lloyd dignified by the name of the " watch-dog "?

A.—Yes.

Sir H. Courthope-Munroe.—What sort of watch-dog he was we will go into later.

(*Adjourned to to-morrow morning at* 10.30.)

The Committee Assembled at 10.30 a.m. on the 13th November, 1926, all Members being present.

The examination of Sir George Buchanan was continued.

Sir H. Courthope-Munroe.—Sir Grimwood and Sir George: I was going to suggest, if I may, that the time of the Committee would be saved if at this stage, instead of my continuing the re-examination of Sir George Buchanan, I should take advantage of the opportunity you have given me of saying a little upon the meaning, as I understand it, of the agreement. I have to put a number of questions to Sir George which must go upon a certain basis, and I think it would be in the interests of time if I were now, with your permission, to endeavour to deal with what I conceive to be the true construction of the agreement. Then when we have discussed that we are rather more on a basis to go on with my questions to Sir George; but I am entirely in the hands of the Committee.

Chairman.—Certainly.

Sir H. Courthope-Munroe.—Then, with your permission, I will proceed to do that. This matter really opens in consequence of observations which you were good enough to make in the course of the proceedings when, at the end of the meeting on Tuesday, 2nd November, in the course of the morning you put this to me. You said: " Sir George and Sir Harry, this is, in our opinion, a very curious and very difficult agreement. I do not know whether you have studied it at all, but I think if you would consent to extend your powers here a little, and would just address us for half an hour at some time on the text of this agreement, and on the point as to how far Sir George was responsible for the execution of the works as apart from supervision, it would be very useful." That is a matter upon which, on behalf of Sir George and certainly for myself, I am very much indebted to you for the opportunity you have given me. My only regret, if I may respectfully say so, is that this opportunity should be afforded at the 58th meeting, and not at the first meeting; but that is the irony of events.

Chairman.—You were not present at the first meeting.

Sir H. Courthope-Munroe.—I was not present. That is one of those things which really no one can control. Viewing it from my standpoint, and viewing it also from the terms of reference to this Committee, it does seem to me to be essential that before one starts out as this Committee has got to do, to apportion blame one must ascertain what is the contractual duty, and even, if I may so put it, the moral obligations of those persons who are concerned in the matter.

Chairman.—Did you say: " Before this Committee starts out, as it wants to do, to apportion blame "?

Sir H. Courthope-Munroe.—No.

Chairman.—We do not want to apportion blame. We may have to do it as part of our duty.

Sir H. Courthope-Munroe.—I agree; but what I meant was this. Taking, very shortly, the original terms of reference, you are to enquire: " Into the history of the inception and conduct of the Back Bay reclamation scheme." Naturally you have had, in an immense enquiry like this, largely to amplify that; but taking the mere word " conduct," that must mean and can only mean the conduct of A, B, C, D, E, and F—whoever have been concerned in the matter.

Chairman.—Quite so.

Sir H. Courthope-Munroe.—I respectfully suggest before you can consider and weigh the blame to be attached to the conduct of A, B, or C, you must ascertain in your own minds what you believe to be the contractual obligation of A, B, C, or D. That is too obvious, almost to state. That being so, it is a matter of regret that this agreement, which is the basis and the foundation, in one sense, of this enquiry, should lend itself to

being spoken of by you as "a very curious and very difficult agreement." I am not prepared to challenge that for a moment. It is emphasised, if need be, by this fact, that almost throughout this enquiry Sir Frederick Hopkinson has intimated his view as being that my client's position is, for all practical purposes, that of a contractor. That is his view, and he may be entitled to hold it. On the contrary, another member of the Committee, Sir M. Visvesvaraya—I do not know whether he happens to be a lawyer—has expressed a view, which is the view I take and the view which I am going to urge upon you most strongly, which is directly contrary to the view taken by Sir Frederick Hopkinson. Might I refer briefly to page 21 of the Evidence, and read what Sir M. Visvesvaraya said, because it expresses very succinctly and very clearly the view I want to put before you

Chairman.—Which note are you reading from?

Sir H. Courthope-Munroe.—I am reading from page 21 of the notes of the evidence of Sir Lawless Hepper in cross-examination.

Chairman.—That is page 21 of the evidence of Sir Lawless Hepper.

Sir H. Courthope-Munroe.—Of the print, not of the type. I only read this because it shows the various views. We have a difficult agreement to construe, and you have the view on one side of one gentleman, and the view on the other side of another. Before you can endeavour to do justice you must get, if you can, at what the meaning of that agreement is, and attach a meaning to the agreement.

Chairman.—Certainly.

Sir H. Courthope-Munroe.—Sir M. Visvesvaraya says this: "The engineers give professional advice, but they have no responsibility for the expenditure. The responsibility must rest either with the Director or with the Government of Bombay.—(A.) The Government of Bombay sanctioned the estimate. (Q.) But they worked through you? —(A.) Yes; but Meik and Buchanan are to carry out the work." Perhaps I might break off there to call attention to this. That answer is incorrect, if you look at paragraph 3 of the agreement, as I shall do in a moment. You will find that the carrying out of the work is, by paragraph 3, dealt with in distinct terms. Those words: "Carry out" are used in that paragraph 3, and, as far as I can see, they are not used anywhere else. That is handed over to the Director of Development and to the resident engineer. The next question put by Sir M. Visvesvaraya is this: "The local Directorate carries out the work, and is responsible for the expenditure. All technical advisers take no responsibility for the progress of the work, or for the expenditure. They advise at every stage." Then you very properly pointed out that that depended upon the construction of the document, which it obviously does. Then you say: "When he was described as engineer Sir George Buchanan's assertion was: 'I am nothing of the sort.' He wrote a letter to say: 'There appears to be a misunderstanding. We are not consulting engineers. We are the actual responsible engineers.'" Then Sir M. Visvesvaraya says: "That is their assertion, but it has not been accepted by the Government.—(A.) Of course." There, again, may I pause to say this? In discussing this matter with you I am accepting your invitation to discuss it as a lawyer. What Sir George Buchanan may have thought fit in the loose language of letter-writing to assert or not to assert, does not affect the position I am putting before you. I am putting before you, to the best of my ability, the documents and the agreement, and I am asking you to construe them. I agree with what Sir M. Visvesvaraya says: "That is their assertion, but it has not been accepted by the Government."

Chairman.—Will you just consider an intermediate possibility, the possibility that they were engineers, and in certain respects performing work generally performed by contractors? That does not necessarily mean that they had any responsibility for the execution of the works at Bombay. We must keep that very clearly in our minds.

Sir H. Courthope-Munroe.—I follow you.

Chairman.—But were they solely and entirely in everything they did engineers, or were they not, as regards some very important part of the work, doing work ordinarily done by contractors? Supposing one were to agree with you, then you have to look a stage further and ask: "Was there, in fact, any responsibility for the execution and the progress of the work in Bombay apart from the duty of supervision?"

Sir H. Courthope-Munroe.—Yes; I quite agree, and I am much obliged to you for putting it to me so clearly.

Chairman.—Those are the three positions.

Sir H. Courthope-Munroe.—Yes. When I come, at a later stage, to the actual document, I shall endeavour to extract from that document the whole of Sir George's contractual obligation, and the whole of his duty, as I conceive it. So much for that.

Before I come to deal with the actual document and the modification that was made in 1923—you remember there was a letter about it, and I treat it as one—it is necessary in order to get into one's mind the position to refer to four matters. First of all, there is the report of 1919. I shall touch upon that very lightly. Then there is the scheme—I think that is the correct word to use—called the Bombay Housing and Development Scheme, which was the result of the report.

Chairman.—I do not quite follow that—the report of 1919?

Sir H. Courthope-Munroe.—There is Sir George's report of 1919 which we have had *ad nauseam.*

Chairman.—Then you said the Bombay Housing and Development Scheme?

Sir H. Courthope-Munroe.—There is a document I have got called " The Bombay Housing and Development Scheme." That is dated the 17th March, 1920, which is the following year. I want to refer to that because that in effect deals with the foundation of the Development Department.

Chairman.—Yes; the Development Directorate.

Sir H. Courthope-Munroe.—Then the next stage which I want to refer to again in some detail is Lord Lloyd's evidence, because he deals with the history of the thing and the calling in of Sir George, his report, then the scheme, and then he tells the Committee what he thought to be the working of the scheme within the intention of the agreement. Then, lastly, we come to the agreement.

Linking those four together, I say that the scheme shows that the view put forward by Lord Lloyd to this Committee was the correct view of what was intended. I accept every word of what Lord Lloyd said, and I go further, and say that the actual agreement entered into between the parties was this. Although I agree it was very curious, as the Chairman has said—most curious—I want to say, with regard to the things it was to do, and in the events which have turned out, it is difficult of construction; but when you look through the whole thing, the scheme, the intention of the scheme, Lord Lloyd's evidence, and what he said the scheme was intended to do, and the agreement that was in fact entered into, I say they all point to the fact that the ultimate result is that my client was in the position pointed out by Sir M. Visvesvaraya in the extract I read.

Mr. Billimoria.—May I request you kindly to add the interview which Sir George Buchanan had with the Secretary of State, as the fifth point in linking up those various points?

Sir H. Courthope-Munro.—I do not quite follow what that is.

Mr. Billimoria.—It is the interview which Sir George Buchanan had with the Secretary of State before the scheme was embarked upon.

Sir H. Courthope-Munroe.—What is your proposition upon that?

Chairman.—Mr. Billimoria wants you to recite the statement which Sir George Buchanan himself has given us. There is a rather important passage in it.

Mr. H. Courthorpe-Munroe.—Is that in Sir George's statement?

Chairman.—Yes. That is what is in your mind, Mr. Billimoria?

Mr. Billimoria.—Yes.

Sir H. Courthope-Munroe.—I should like the reference, as I am anxious to put every card there is on the table.

Mr. Melville.—I think it is at the bottom of page 50, the interview of 1920?

Mr. Billimoria.—That is it.

Sir H. Courthorpe-Munroe.—It is the interview with Mr. Montagu.

Chairman.—The particular passage Mr. Billimoria wants is about a third of the way down from the top of the page.

Sir H. Courthope-Munroe.—Perhaps I might read it, if Mr. Billimoria would like it read. It is Clause 59 of the statement made by Sir George Buchanan, and runs in this way: " On the 20th April, 1920, at an interview at the India Office with Mr. Montagu, Secretary of State for India, I presented a memorandum, of which the following are extracts, detailing the position of the Back Bay scheme up to date: the position when I left Bombay was as follows: The scheme, as prepared by myself, had received the approval of both the Government of Bombay and the Government of India."

Chairman.—I do not think that is the part. The passage which Mr. Billimoria wants is where Sir George Buchanan assured the Secretary of State that he would, if necessary, give up other work in order to give his full attention to this work.

Sir H. Courthope-Monroe.—Yes, I think I have it now. It is on page 50: " I then explained to him my position, namely, that after my scheme had been approved, Sir

George Lloyd had asked me whether my firm would be the engineers, as he did not wish the Bombay Public Works Department to have anything to do with the work. I had agreed on behalf of my firm, and had promised to make the carrying out of the work my principal object, if necessary declining work elsewhere, and I had agreed to go out and spend several months every winter in Bombay."

Mr. Billimoria.—Will you kindly link that up in the course of your argument with your other points? We should be very much obliged.

Sir H. Courthope-Munroe.—Certainly. Is there anything else you would like me to read?

Mr. Billimoria.—No.

Sir H. Courthope-Munroe.—To pursue my story, I do not think I can usefully refer again to Sir George's report of 1919, because we have discussed it almost *ad nauseam*.

Now I pass to what I think is a most important point, and that is with reference to this Bombay Housing and Development scheme. You ought to have that document in front of you.

Chairman.—What we have been working on really is the speech of Lord Lloyd on the 3rd August, 1920.

Sir H. Courthope-Munroe.—This apparently is the document, with the correspondence and so forth, that led up to the establishment of the Development Directorate; and it more or less indicates what, according to the intention of the Government, should be the duties of the various parties concerned. I am only concerned to draw attention to two passages of this document. The first is page 19, where you will find this, in paragraph 10: "The following *inter alia* shall fall within the scope of the Directorate's work. It should carry out the Back Bay Scheme, the East Colaba Scheme, and any other reclamation scheme which it may be found desirable to undertake in or near Bombay." There again, I pause to point out that, so far as I can see, these words "carry out," which is another way of saying "in detail," are found in the agreement, and they are found here, and they are found in the Rules and origin of the Development Department; and in no case, so far as I know, in the terms so far as Sir George's obligation is concerned. I suggest to you this expression "carry out" obviously means, when you come to look at the contract, the details. It means Mr. Lewis; it means the Resident Engineer; it means his deputy, staff and so forth.

Chairman.—Lord Lloyd read that passage in the speech of August, 1920, to which you have referred.

Sir H. Courthorpe-Munroe.—Thank you. You will forgive me if I go over the same ground, but we have got the thing to a head here; and we have to consider what in fact everybody thought was their duty, and what they were working in fact, and what is also the legal construction. If the legal construction turns out to be something different, under the terms of this extraordinary document, it is to go to an Arbitrator, who is to settle it for all time, and apparently with no appeal to anybody. I suggest when you come to look at it, what in fact was the conception of the parties concerned is the right conception; and Sir George's obligation and duty are limited in the way I suggest.

May I pass to the other passage, on page 37? There they are dealing with the formation of the Directorate of Development. This I think is a letter in which the Secretary of State gave his approval to that being done. It is from the Viceroy, the Finance Department, to the Secretary of State for India in London. He says: "Please refer to Education Secretary's letter No. 6, dated 26th February last, Bombay Housing and Development Scheme. We agree to the formation of a Directorate of Development" —this is the important part—"for the execution of the industrial housing scheme with the two reclamation schemes, Back Bay and East Colaba." As we know, that Department was established, and Sir Lawless Hepper was put in charge of it. I say this document itself shows that the Department came into being for the purpose of carrying out the scheme, and was charged with the execution of the scheme.

May I go now to the evidence given by Lord Lloyd? Lord Lloyd gave a good deal of evidence about it. In view of some answers that had been given to you by Sir Lawless Hepper, that he had no responsibility, or no practical responsibility, you put these questions to Lord Lloyd, which are on page 42 of Lord Lloyd's evidence. You say: "He"—that is Sir Lawless Hepper—"has disclaimed any suggestion that he was employed because of any technical knowledge. What do you say as to that? Then Lord Lloyd says: "I should not agree in those terms. Sir Lawless Hepper, if he had not been an engineer, and had had various other qualifications which seemed necessary for the task to which he was going to be put, probably would not have been appointed, speaking in general. Sir Lawless Hepper was selected as the Director of Development because the success of the Development scheme depended, to a very great extent, on the capacity of whoever was appointd at the head." What more weighty language can you have? Apparently it is suggested now that this gentleman who was appointed, and on whose capacity Lord Lloyd says to a very great extent the whole thing depended, can wash

his hands of the whole thing, and lay it down at the feet of my client. Let me go on: "The work, as you know, was of a very exceptional character, and its operations were on a very large scale. We had to combine in our Director a great many different qualities. It was necessary that the Director first of all should have a very close acquaintance with local conditions." That is something which Sir George could not have, by the nature of things. "We might have got somebody from America, or from a great distance, but it would have taken him two or three years in which to learn the local conditions. It was, therefore, considered important that we should get a man who already knew the local conditions." Then comes point No. 2: "It was very important that he should understand traction and transit problems, because the whole of that Island problem (not the whole of it, but a large part of it) is a traction problem. He (that is Sir Lawless Hepper) had those two qualifications in a very high degree. He knew the place intimately. He was acquainted with traction problems, as you have just pointed out. He had had a distinguished career as a Railway Engineer, and he was then holding a very important post on the railway, as you have also pointed out." I understand he was General Manager of the Great India Peninsular Railway. "He had been further proved during the war by his work as the Local Controller of Munitions, and he stood, I think I can say, exceptionally high in the estimation of the Government of India, and what was also of great importance, he stood very high in the estimation of the public of Bombay. We had to raise public loans, and it was very important that the Director of these works should have the confidence of the public from whom we were asking the money. The local public, in a narrower sense, had great confidence in him. As a Railway agent, as Member of the Port Trust and City Improvement Trust, he was very well acquainted with all the local conditions, and, combining those four qualifications, he seemed to be almost unique in experience for that particular post. Those were the conditions which led to his appointment, therefore to some extent his engineering, in a general sense, was a qualification—not very specific." Then missing a question, you put this question: "Was Sir Lawless Hepper the person responsible for the carrying out of the works in Back Bay, or were Messrs. Meik and Buchanan, or Sir George Buchanan, responsible for it?" Then Lord Lloyd very properly says this: "That is not a question to which can be answered Yes or No. You have taken a great deal of evidence on this question, and perhaps it would be better if I described to you what were his functions." Then you say: "Will you please tell us the organisation of the Development Directorate, and then if you please, tell us with regard to Sir Lawless Hepper's special position." Then the answer is this: "I will do my best. In describing the duties of Sir Lawless Hepper, and his relation to the local Government, it is necessary to distinguish between the Secretariat Department and the Executive organisation, as a matter of fact the term 'Development Department' I notice has been used to cover both. The Secretariat Department, for any activity of Government, is the organisation which deals with the business which comes before Government, and through which they issue their orders. I think that is natural and plain. The Secretary is the principal of the Department, responsible to Government for the conduct of business, and for the issue of their orders. He is the channel, but the Secretary as such (and anyone familiar with the organisation in India will know it) has no executive powers. The Executive is usually a separate organisation presided over by a separate officer, often known as the head of the Department. In this case which we are discussing, the Executive Department was known as the Development Directorate, and its head is the Director. I can give you a suitable analogy in the case of Public Instruction in India. There is a Secretary to Government for Education, which is the channel through which Government deals with Education; and the Executive head of the Department is the Director of Public Instruction. I hope I have made the position clear. The Secretary to Government in the Development Department was also the deputy of the Director in the Executive Department. Is that quite plain?" Then he goes on to say this: "Sir Lawless Hepper's relations to the local Government, generally speaking, are the same as those of the head of any other Department. Any difference was largely in the exercise of discretion. In the Back Bay reclamation scheme his functions were qualified by the agreement with Meik & Buchanan, who ultimately became responsible for performing the work and duties set forth in that agreement." That is the point. I do not want to avoid one iota of my responsibility under the agreement; but everybody seems to have assumed that had put the agreement aside. "You are responsible for the whole thing." Anything within the four corners of the agreement I do feel a responsibility for; and that is all Lord Lloyd points out Meik & Buchanan are responsible for. Then he says "I need not recite the terms of the agreement, because they are before you." This is the text, the important part, which I am now coming to. Then Lord Lloyd says: "Messrs. Meik & Buchanan designed the work." I pause there to say for any fault in design, in estimates or things of that kind that are within the province of Sir George, he is answerable for and responsible for. Then Lord Lloyd goes on to say: "And the director"—that is Sir Lawless Hepper —"was responsible to Government for ensuring that the works were carried out

according to the firm's design by the Chief Engineer." Mark that again—mark the words "carried out". They are in the agreement and in the scheme—" to carry out ". " The director was responsible to Government for ensuring that the works were carried out according to the firm's designs by the Chief Engineer." The word used there is " Chief ", but in the agreement it is the same or synonymous with the one who is called the Resident Engineer. " The programme of the work was set forth from time to time by Sir George Buchanan. The relations of Sir George Buchanan and Sir Lawless Hepper to Government might be described in general terms by saying that the former was responsible for the strategy and the latter for the tactics of the scheme." I do not know whether we have any military member on the Committee, but Lord Lloyd put it in that way. " The Director was responsible, for example, for organising the staff, though the principal appointments required the orders of Government, while the Chief Engineer's appointment "—that would be Mr. Lewis—" was subject to the nomination of Sir George Buchanan." Then he says: " These were not watertight compartments, and that is the difficulty of answering your question absolutely precisely. In no great organisation can it be so. The staff recruited in England was engaged by the India Office, or by the High Commissioner's Office, and the selections were usually made on the recommendation of Sir George Buchanan." May I pause there to clear up one matter? It was pointed out yesterday by Sir Frederick Hopkinson that as he conceives it, it was the duty and obligation of Sir George Buchanan to know all the men who went out to work the dredgers.

Sir Frederick Hopkinson.—No, not that, but how many there were—not to know them personally, but to know how many there were.

Sir H. Courthope-Munroe.—I agree. I want to point out and make a strong point of this. When I come to the agreement you will find that Sir George Buchanan's power to nominate anybody or to have any concern with anybody who was selected by the Indian Government began and ended with two persons, the Resident Engineer and the Deputy Resident Engineer. In point of fact he nominated those two gentlemen. One at a certain stage retired, and then I think he nominated a third. As regards those three persons he was, by his contractual obligation, bound to nominate and honestly nominate them, and do the best he could, but anything else he did was merely done by kindness and by way of endeavouring to further the best objects of the scheme. It is altogether wrong to suggest that because he was asked " Do you recommend A, B or C? " that he had not a duty in the matter a all. He honestly performed his duty when his contractual obligation began and ended with the nomination of these two people.

Now I pass on. Lord Lloyd continues: " The Director "—that is Sir Lawless Hepper—" was also largely responsible for obtaining plant according to the plans and specifications of Sir George Buchanan." Then Lord Lloyd said he thought that the Director was " the Government watchdog," in face of the disclaimer by Sir Lawless Hepper of any responsibility so far as I can see, and suggesting that everything should be laid at the door of Sir George. What is the meaning of that—" he is the Government watchdog "? When I come to deal with the ordinary terms of contract you will find the so-called watchdog in the engineering profession is invariably the Resident Engineer. Here you have somebody put up over his head who is described in apt language as " the Government watchdog." Then, says Lord Lloyd: " That was his main function. It was his duty to see that the organisation was working efficiently and economically. Any departure from the technical proposals of Sir George Buchanan, or any proposed action in disagreement with the latter, would have been referred presumably for their orders. That is about as precise as I can give you, the relations between Sir George Buchanan and the Director of the Development Department. Does that in any way answer your question? " I do not think I need read any more of that. I think that covers the ground. Could you get anything more clear or more distinct as to what Lord Lloyd intended to be the respective duties of the parties? If I read that rightly, the whole of the execution, the whole of the carrying out, the whole of the watching, the whole of the economical working and smooth working were to be carried out by the Department. On the top of that you have a gentleman who is described as the Government watchdog. In the events that have happened the watchdog appears to have retired, and the responsibility for everything that has happened, so far as I can see, is laid at my client's door. That is why at this eleventh hour I am only too glad to be in a position to try and come to close quarters with what the agreement means.

Having got the intention of the scheme, the scheme authorised by the Viceroy, having got Lord Lloyd's view of what the scheme was intended to carry out, let me now go to this document.

Mr. Billimoria.—Before you proceed further, may I just put one point?

Sir H. Courthorpe-Munroe.—I am much obliged to you.

Mr. Billimoria.—You are emphasising the word " carry out."-

Sir H. Courthope-Munroe.—I am coming to that; I have not done with it yet.

Mr. Billimoria.—Could you draw any distinction between carrying out and execution? What is the distinction or line of difference between the two?

Sir H. Courthope-Munroe.—We shall have a lot of talk about the actual meaning of the words when we come to the agreement. Before I start endeavouring to elucidate the true meaning of this agreement, which I agree is a curious one, most unusual and wants careful consideration, I think it will assist the Committee if they will let me outline what is the ordinary agreement which is entered into for public works as executed abroad, where you have got consulting engineers in London and you have got a Resident Engineer in charge of the local works. If you will be good enough to look at that document I think it will assist you to try and follow what I am putting to the Committee. (*Document handed in*). I have only put it down in that form in order to try and bring home to the minds of the Committee, some of whose members may not be familiar with the position what is the ordinary example of such an agreement. You may like to look in this connection at a case which I have found, which is commonly known as the Brazil case, which is the case of large works which were being executed in Brazil with a London engineer. There they deal with the position of Resident Engineer and emphasise his independent position. The only report of the case so far as I know is in Hudson's Building Contracts, Volume 2, page 18. It went to the Court of Appeal. It is headed " In the Matter of an Arbitration between Snell & Co. and the Rio de Janeiro Flour Mills and Granaries, Limited." I only mention the case because these cases so rarely find their way into the Courts, as they are nearly always dealt with by arbitration. But this is a case which travelled up so far as the Court of Appeal, and was considered by Lord Coleridge, Mr. Justice Mathew (a great commercial Judge), Lord Esher and Lord Justice Fry. There is in that case a form of contract which is more or less the form of contract which obtains in connection with big works abroad which are supervised by the engineer in London with the Resident Engineer in charge. I will hand that to you later.

Let us just take the ordinary case of any large private contract abroad. In every such case you have the building owner to start with; then you have the engineer, who, for reference purposes, I call the principal engineer, to distinguish him from the Resident Engineer, and the people who are doing the work on the spot. His duty is to make plans and specifications, and then to supervise. When he supervises he inspects and deals with the reports of his agent. It is his agent, mark that, not somebody else's agent, but his agent, the Resident Engineer. He approves the work and gives certificates on which alone payment is made. That is the man in London. The next person in the chain is the Resident Engineer abroad, who is nominated by and under the sole control of the principal engineer. He superintends details, and reports to his principal. To emphasise that may I just read one paragraph in the professional rules of the Association of Consulting Engineers? This is the point which all engineers lay the greatest stress upon : " The engineer alone, and not the client, can have authority to give instructions to the contractor, Resident Engineer, Clerk of the Works, and Inspectors on all works done to the engineer's specifications or drawings." Under these contracts, as I say, this Resident Engineer is under the sole control of the principal engineer. What does he do? He superintends the details, and writes to his principal. I invite the Committee at this stage—because I must deal with it at somewhat greater lengths when I come to the contract itself—to observe that there is a vast distinction between the words " supervise " and " superintend.". I want you to grasp that and not to think that I am playing with words as a mere lawyer; all these things have professionally a distinct and well-defined meaning.

Sir Frederick Hopkinson.—But the case you are assuming now is the case where a contractor is employed?

Sir H. Courthope-Munroe.—Yes, obviously. No one is more familiar with that than yourself. I am taking the case of a contractor. Lastly in the chain, you have the contractor who does the work. This result arises from working out in Westminster the working of these contracts—to provide an effective check on the expenditure and a guarantee that the work is properly done. The effect of all this is that not one penny piece can be got by the contractor except with the approval of the principal engineer, who grants his certificate, as Sir Frederick well knows, after he has had his reports from his Resident Engineer. That is the safeguard. That is, I venture to say (and I invite any criticism), the scheme of an ordinary private contract for big works that are done abroad, work in many cases involving very large sums of money though not so big as in this case.

Let us see what this contract has done. The building owner in this case is the Bombay Government working through the Secretary of State of India. He takes the place of the building owner. The engineer—I have struck out the word " principal "

because the word " engineer " is the only word that actually appears in the document, but I mean the consulting engineer—in this case is Sir George Buchanan. The Resident Engineer in this case is made absolutely independent of the principal engineer. That is the keynote of the whole thing. He is under no obligation to make any reports, and all the principal's instructions, as you will see when I come to deal with them, are all controlled by the Departments. No reports had to be made by the Resident Engineer. He is not the servant of the principal engineer; he does not pay him, and he cannot dismiss him. The principal engineer has to give no certificates for the execution of the work, and he is in no way concerned, unhappily, with the value of the work done. The Resident Engineer, who, as I have told you, in the case of an ordinary contract is, if I may use the expression, the alter ego, the eyes of the man in London, in this contract is placed entirely independent of any control of the engineer in London. But he is put under the control of the Department. He is paid directly by the Government, and is dismissable by the Government. If one may refer to the expression which has been used, " watchdog," in every ordinary contract the watchdog is the Resident Engineer. But for his reports no certificates will be granted by the principal engineer in London. There is the safeguard. You cannot get a penny piece except you work up in that way. The effect of this arrangement is absolutely to short circuit all that scheme, because you find, when I come to the last stage, the contracting stage, all that is represented by the Director of Development and his staff. All check on the expenditure by the principal engineer or any guarantee as to the value of the work done is entirely cut out. You have the Bombay Government, the employer, in direct communication with the Director of Development and his staff, who take the place of the contractor, and you have got what Sir Frederick Hopkinson, I think, ridiculed, and I think very fairly ridiculed when the evidence was being given. You have got this regular scheme, and then you have this extraordinary scheme which was evolved for the work of this particular contract. You short circuit all the guardianship of the principal engineer and the Resident Engineer. You put the employer who is doing the work in direct communication with the Department who are spending the money. You short circuit these people, and you work upon a system—I am disposed to use the language which was used by Sir Frederick Hopkinson when he called it a comic opera performance. " Then you come to the question of who makes these project accounts. It seems to me rather a comic opera performance, because the man who makes the project estimate is the man who is going to carry out the work.—(A.) That is true. (Q.) Therefore he would be more than human if he cut his prices down?—(A.) Exactly, I agree. (Q.) If he cut his prices down and the work cost a little more than his estimate showed, he would get into serious trouble?—(A.) He would. (Q.) If he put his prices twice as much as he need, and he did it with three-quarters, he would be considered a more or less reliable man?—(A.) I quite agree. (Q.) Although the work might have cost 50 per cent. more than it ought to have cost?—(A.) Yes."

Sir Frederick Hopkinson.—That was intended to apply not only to the Back Bay reclamation scheme, but to the whole of the Public Works Department. It is a general comment.

Sir H. Courthope-Munroe.—I agree. To anybody who is conversant with these things it is too obvious. I think if one just considers the position between what I may call the ordinary type of contract and the ordinary safeguards which the evolution of time and the ability of lawyers and the ability of engineers has evolved, and, comparing it with this contract which was entered into, one has not far to travel to find out why this enormous waste of money has taken place.

Let me go at this stage to the actual document, the agreement. The agreement runs in these terms: " Memorandum of agreement made this seventeenth day of March, nineteen hundred and twenty-one, between Charles Scott Meik and Sir George Cunningham Buchanan, K.C.I.E., carrying on business as civil engineers in partnership under the name of Messrs. C. S. Meik & Buchanan, at 16, Victoria Street, Westminster, in the County of London (hereinafter called ' the firm,' which expression shall include the said Charles Scott Meik and Sir George Cunningham Buchanan and their successors being partners in the firm, and their and each of their respective executors and administrators)," of the one part, and then the second part: " The Secretary of State for India in Council (hereinafter called ' the Secretary of State ')." Then it recites that the Secretary of State: " is about to carry out a scheme for the reclamation of a part of Back Bay, Bombay, which is known as the Back Bay Reclamation Scheme, and it comprises the whole of the works described in the report made by Sir George Cunningham Buchanan." Then this is the material recital which we now come to: " And whereas the firm have been engaged by the Secretary of State as engineers of the Back Bay Reclamation Scheme and of all works in connection therewith upon the terms hereinafter mentioned." I pause to point out that these gentlemen were engaged as engineers. They were not engaged as quarry masters or as persons in charge of barge operations, but they were engaged as engineers. Then the agreement

goes on: "Now it is hereby agreed as follows: (1) The firm agree to act as the engineers of the Secretary of State in carrying out the said scheme and in the construction and execution of all works connected therewith (hereinafter referred to as 'the works') until the final completion thereof, and the firm shall at all times assist and advise the Government of Bombay in all matters relating to the execution of the works, and shall supervise the same and undertake and perform all work and duties devolving upon engineers of large works." Again, I lay emphasis upon that, and I also call the attention of the Committee to the fact that it says, "and shall supervise." I am going to draw attention in a moment to the definitions. If one may paraphrase it, that means "inspect and report." It does not mean, as Sir Frederick Hopkinson was good enough to suggest, that we should go on board the dredger and stop there till it worked properly—it means nothing of the kind.

Chairman.—It was I who made that suggestion.

Sir Harry Courthope-Munroe.—Forgive me, you may have made it also.

Chairman.—I undoubtedly made it.

Sir Harry Courthope-Munroe.—It was pressed to this extreme limit by Sir Frederick Hopkinson yesterday, and I want to deal with it. He said, when dealing with this everlasting question of the working of the dredger, which we all agree is the crux of the thing, according to my note, and I can check it with the Shorthand Notes: "You ought to have stayed on the dredger until the results were achieved." That is what Sir Frederick said yesterday.

Sir Frederick Hopkinson.—Prefacing it by saying: "Or find out why they were not being achieved."

Sir Harry Courthope-Munroe.—Speaking as a man of the world, not as a contractor or a lawyer, I agree.

Sir Frederick Hopkinson.—Of course you do.

Sir Harry Courthope-Munroe.—But the question we are discussing here is not whether it ought not to have been done, but who ought to have done it. I do not quarrel with the question as a question, except in relation to its being put to Sir George.

Chairman.—The other way of putting it which you are suggesting is whether there is to be found in the four corners of this agreement the legal duty to do it.

Sir Harry Courthope-Munroe.—Yes; and if I may venture to say so, I go even higher than that. I do not want it to go forth to the world that we, in this matter, are sitting tight upon our legal rights. I say no human being can gather from this document any moral obligation to do it. How can it be said for a moment that a gentleman in the position of Sir George, who has got works all over the world, and who admittedly lives in London, where the execution of the works and the carrying out of the works are upon the very terms of the scheme to be done by the Directorate, that it is any portion of his duty to get on board this dredger and stay there till it works properly?

Sir Frederick Hopkinson.—That would come under a moral obligation.

Sir Harry Courthope-Munroe.—Well, I should doubt it. How could it?

Chairman.—Sir George Buchanan being in Bombay, and being the great expert, might well have conceived it his duty to go on board the dredger and find out exactly what was happening, and might well have conceived it his duty to go to Malabar Hill and have a conference.

Sir M. Visvesvaraya.—I may add that he is also expected to devote the greater part of his time, under the agreement, to this particular work.

Sir Harry Courthope-Munroe.—I want to take it by steps. I do not for a moment want to avoid anything at all.

Chairman.—You had got down to the work in England.

Sir Harry Courthope-Munroe.—Yes: "Devolving upon engineers of large works."

Mr. Billimoria.—Before we proceed to "work in England," where is the distinction drawn between the "execution of all the works" and "the carrying out of the works." What is the difference?

Sir Harry Courthope-Munroe.—I want to answer your question. What is your question again?

Mr. Billimoria.—Taking the first line of the paragraph: "In carrying out the said scheme and in the construction and execution of all works connected therewith." What is the distinction you draw between "execution" and "carrying out" of all the works?

Sir Frederick Hopkinson.—It occurs again in the fifth line: "the execution of the works."

Mr. Billimoria.—Will you kindly enlighten us on that?

Sir Harry Courthope-Munroe.—" In carrying out the said scheme," and " in the construction and execution of all works "—it is all controlled by the word " engineers."

Chairman.—Is that your point?

Mr. Billimoria.—That is my point.

Chairman.—You say that the whole of that clause is governed by " The firm agree to act as the engineers "—as engineers in carrying out, as engineers in the construction and execution of all works, and shall supervise the same as engineers and undertake and perform all work and duties devolving upon engineers—which means : " ordinarily devolving upon engineers."

Sir Harry Courthope-Munroe.—That is it.

Chairman.—You say the whole thing is governed by the phrase " as engineers "?

Mr. Billimoria.—If it is the word " engineers," that is one thing; but the expression here is " the engineers." It is more emphatic. It is not only " engineers," but " the engineers."

Sir Harry Courthope-Munroe.—As a lawyer, I hope I shall not try to avoid responsibility by looking at this document as closely as that. It is a rule that you will agree to at once, I think, that the meaning of general words in an agreement must be construed with regard to the text of the document. You have to find it within the four corners. If you find here and there a word which is of somewhat doubtful meaning you must construe that by reference to the whole context of the document. That is elementary from a lawyer's point of view. Let me go on. That is what they are to do as engineers. Then the document turns to " Work in England " : " (*a*) The preparation of the working drawings, specifications, schedules of quantities and rates and estimates of cost for the whole of the work included in the report of Sir George Cunningham Buchanan." May I get rid of the document, which has been called the modification which was agreed to on the 13th January, 1923, by saying if you write in four or five words into Clause (*a*) you give effect to that document? Paragraph (*a*) should read in this way now in consequence of that modification, and you will check me on this : " The preparation of the working drawings, specifications, schedules of quantities and rates and estimates of cost for the whole of," insert the word " permanent " : " work," and then add : " and storm water drains " : " included in the report of Sir George Buchanan." If you insert those words you have given effect to this modification as far as it affects the agreement, and I need not weary the Committee by reading all through this. That is the effect of this modification. Then the agreement goes on to say : " And such work shall be commenced forthwith, and all such drawings, specifications, schedules of estimates and any fresh or amended drawings, specifications, schedules of quantities and rates and estimates as may from time to time be required during the progress of the works shall be promptly prepared and forwarded to the Government of Bombay, and shall become the property of the Secretary of State." There is no quarrel on that at all. Then Clause (*b*) is : " The approval in conference and in conjunction with the consulting naval architect to the Secretary of State of the detailed drawings and specifications of the dredger and floating pipe line, and the final inspection and supervision of tests and trials "—you observe those latter words. I only pause there to say that there is nothing whatever to show or suggest that what Sir George says is the usual practice; namely, to test at the place of manufacture, coupled with the firm's guarantee, or coupled with their representation as to the working capacity of what they are supplying is to be departed from, or to suggest that the test is to be in Bombay.

Chairman.—On the contrary, it is headed " Work in England."

Sir Harry Courthope-Munroe.—If you please. That emphasises it. It says : " The final inspection and supervision of tests and trials."

Sir Frederick Hopkinson.—In accordance with the contract.

Sir Harry Courthope-Munroe.—Yes; I merely point that out. In the light of events, if one could look ahead and forecast all the hundred-and-one things that are going to happen when one drew contracts, one would dot one's i's and cross one's t's, and put in a great deal more than one does.

Then we go to (*c*) : " The approval in conference and in conjunction with the consulting naval architect to the Secretary of State of the detailed drawings and specifications of intermediate pumping stations, shore pipes, and the general inspection and trials of the same. Then (*d*) is : " The preparation of plans and specifications for all other plant required in connection with the construction of the works and the inspection of such plant and any material required for the works prior to shipment."

I pause there to point out this. Obviously, on the true meaning of these paragraphs, the dredger is plant.

Sir Frederick Hopkinson.—May I interpose here a moment, and point out to you that this provision in (*d*) is not required where such contracts as you have been speaking of, foreign contracts, are carried out by an engineer through a firm of contractors? The engineer never in those cases draws the plans and specifications for plant.

Sir Harry Courthope-Munroe.—I am not prepared to cross swords with you on that.

Sir Frederick Hopkinson.—That is so. The contractor is left to his own devices.

Sir Harry Courthope-Munroe.— I am only endeavouring to point out this. I start with agreeing with the learned Chairman that this is a curious and difficult document to construe, and quite an unusual one; but we have to get down to bedrock now and endeavour to find out what it does mean. I suggest here on the true construction of (*c*) and (*d*) the dredger is plant, and there is no provision made for the " inspection of plant and material required for the works prior to shipment."

Chairman.—What Sir Frederick Hopkinson is pointing out is that ordinarily an engineer would have nothing to do with any plant. That is for the contractor. If it happens that the contractor brings upon the proposed site plant that is not effective, then the engineer says: " Take it away."

Sir Harry Courthope-Munroe.—I quite agree.

Chairman.—As regards the actual provision of the plant the engineer does not trouble about that in the slightest degree. It is up to the contractor to provide himself with such plant as will enable him to do the work within the specified time—such plant as satisfies the engineer or the resident engineer.

Sir Harry Courthope Monroe.—I quite agree. I am not disputing that for a moment.

Chairman.—That is the whole point.

Sir Frederick Hopkinson.—That is the whole point.

Chairman.—That is why this may be a hybrid agreement.

Sir Harry Courthope-Munroe.—I quite agree.

Sir Frederick Hopkinson.—You will remember also that I pointed out to Sir George Buchanan some days ago twelve works that he had done in connection with this scheme which are not ordinarily done by the chief engineer, but are always left to the contractor.

Sir Harry Courthope-Munroe.—Yes.

Sir Frederick Hopkinson.—Which separates the position as it exists in Bombay from the cases you have given, such as the Brazil case.

Sir Harry Courthope-Munroe.—Yes.

Sir George Buchanan.—I think I can clear up that point.

Sir Harry Courthope-Munroe.—I do not think you had better take a hand in it at this stage.

Chairman.—You can just make a note of it, Sir George, and deal with it later on.

Sir George Buchanan.—Very well.

Sir Harry Courthope-Munroe.—All I want to point out is this. These paragraphs deal with plant, and I quite agree with what Sir Frederick Hopkinson has said about it, that in the ordinary course it is the contractor's job and not the engineer's; but Lord Lloyd points out the Director, that is in effect the contractor, according to my contention, was also largely responsible for obtaining the plant according to the specification.

Sir Frederick Hopkinson.—Not designing it, but obtaining it.

Sir Harry Courthope-Munroe.—I will leave out " obtaining the plant according to plans and specifications of Sir George Buchanan." In this case the contractor, the Director of Development, was obtaining the plant. It is quite true that we designed that plant. If, and so far as any fault can be found with the designing or with what Sir George Buchanan had undertaken to do, I agree that he is personally responsible; but it is not exactly the same position. Here the Development Department took the place of the contractors, and it was their job, and their job alone, says Lord Lloyd, to obtain the plant. That is how I deal with that. Lastly, Clause (*e*) is: " Correspondence of the Government of Bombay or any officer deputed to act on their behalf, including any reports from time to time required by Government in respect of the dredger plant, or material, or the progress of the woks.

Then I go to " Work in India," and this is very very important: " During the whole period of execution the works shall be closely supervised by the firm." I pause there to deal with this point. It is essential to get a clear understanding of what this

word " supervise " means. I have looked into the professional dictionaries and other dictionaries to find out what is the fair meaning to be given to the word " supervise." I direct your attention to what I believe is the fact, that you will not find in the whole document, certainly not as far as Sir George is concerned, the word " superintend." The primary meaning of the word " supervise " in Sir James Murray's dictionary—the primary meaning is what I am concerned with—is " to look over, survey, inspect." That is the primary meaning of the word supervise. The word " superintend," which is an apt word to describe the duties of an ordinary Resident Engineer, is defined in the same dictionary in its primary meaning as " To have or exercise the charge or direction of operations or affairs." In the course of one's researches I found an illuminating note in the Century Dictionary on the word " supervise " which I venture to think is very applicable to this case. The Century Dictionary points out that the word " supervise " often implies a more general care with less attention to and direction of details than the word " superintend." That exactly bears out what I say. If one may venture in a legal document to paraphrase a word, the best meaning I can give to the word " supervise " is that it does not mean superintend, but it does mean inspect and report —inspect rather.

Chairman.—Where do you get " report "? You said " inspect and report."

Sir H. Courthope-Munroe.—I do not get that word, I agree.

Chairman.—" Supervise " comes from " super " and " video."

Sir H. Courthope-Munroe.—Yes. Report follows in connection with duties, I agree, but I get " inspect." " And Sir George Cunningham Buchanan shall devote the greater part of his time to this particular work." This is the point which Mr. Billimoria was putting to me, and may I endeavour to meet the point? I pause there to point out this. It does not say that he is to give the greater part of his time in India to the work.

Sir Frederick Hopkinson.—But it is all under the words " Work in India."

Sir H. Courthope-Munroe.—I agree, but you have to look at the context. If the fair reading of this document is that Sir George Buchanan is to devote the greater part of his time to the work in India, cadit quastio, but is that the meaning? What it means is that he is to give the greater part of his time to this particular work. Now let me go on: " And shall, unless the Bombay Government agree otherwise, visit Bombay this year and in every year after the monsoon when the working season begins, and remain in Bombay for such period during the working season as he or the Government of Bombay may consider necessary to ensure the complete and satisfactory supervision of the works, and shall also, if necessary in his own opinion or in the opinion of the Government of Bombay, make additional visits during any monsoon." Let me take that word for word. What is the obligation? He shall " visit Bombay this year and in every year after the monsoon when the working season begins, and remain in Bombay for such period during the working season as he may consider necessary." I take up this position most strongly. Short of malafides on the part of Sir George (which I do not think anybody can suggest) on that agreement he, and he alone, is the judge as to whether he should stop there 10 days, 20 days or 30 days, or three months, and nobody else is judge.

Sir Frederick Hopkinson.—But it says: " He or the Government of Bombay."

Sir H. Courthope-Munroe.—If you suggest malafides then I agree, but on a fair reading of that document it is obvious that he is the party to judge.

Sir Frederick Hopkinson.—Or the Government of Bombay.

Sir H. Courthope-Munroe.—I will come to that in a moment; I am taking it by steps.

Mr. Billimoria.—" To ensure the complete and satisfactory supervision of the works."

Sir H. Courthope-Munroe.—I agree, but I must endeavour to take it stage by stage. If one was to decide (which I do not think is suggested) that it was a case of malafides or intention to do anything wrong, then I agree, but once you assume that the man is acting honestly in good faith, it is not open to anybody to say: " 10 days, why you ought to have stopped there three weeks." " Three weeks, why you ought to have stopped there three months."

Chairman.—The question must be, when he went away did he in fact go away before he had completely and satisfactory supervised the work?

Sir H. Courthope-Munroe.—In his opinion?

Chairman.—Yes.

Sir H. Courthope-Munroe.—Given those conditions, I agree entirely. Now let me pass to the next matter. Sir George has given you his evidence, and if my memory serves me rightly it was capped by an apt illustration by the Chairman: one learned

counsel might do in three weeks what another might take three months, and what another might take six months to do and never arrive at any result at all. That is common knowledge. Let me go on to the next paragraph: "As he or the Government of Bombay may consider necessary to ensure the complete and satisfactory supervision of the works." Stopping there, notice it says, "as the Government of Bombay may consider necessary." Once and once only was Sir George asked to remain on, and he did so. In every other case when he left Bombay the Government wished him "God speed." How could it be possibly said many years afterwards that the Government should consider it necessary that he should do otherwise than he did?

Chairman.—There is no evidence that he ever left Bombay in defiance of the wishes of the Government.

Sir H. Courthope-Munroe.—That is what I say.

Chairman.—There is no doubt about that.

Sir H. Courthope-Munroe.—It is carried a little bit further by the fact that on one occasion when he was asked by the Government to remain, he did so.

Sir George Buchanan.—To make a special visit in the monsoon?

Sir H. Courthope-Munroe.—Yes, a special visit.

Chairman.—You went there in July?

Sir George Buchanan.—Yes.

Sir Frederick Hopkinson.—To see the effect of the monsoon?

Chairman.—That is right.

Sir H. Courthope-Munroe.—I venture to put it that the Committee should be thoroughly satisfied that that paragraph 1 has been loyally followed by Sir George, and there is no right to lay at his door any neglect of his duty or any neglect of his obligation at all in respect of that. It seems to me perfectly obvious if he acts *bona fide*, the time he gives to the matter is entirely a matter for his good judgment.

Mr. Billimoria.—Would you call it an error of judgment if there was a lack of supervision? Taking a *bona fide* case, if he did not stay long enough to ensure complete and satisfactory supervision of the works, would you call that an error of judgment?

Sir H. Courthope-Munroe.—Before I answer the question let me see that I understand it. Do you mean to say could a person have properly supervised if he was negligent? No; I should answer that question by saying he could not.

Chairman.—Take an extreme case to meet Mr. Billimoria's point. Supposing as soon as he arrived in Bombay—I am not suggesting that he did this for one moment, you know.

Sir H. Courthope-Munroe.—I am obliged for the argument.

Chairman.—Assuming he arrived in Bombay and he spent a couple of days looking round the place, and then he went to a Christmas camp for 10 days, and then came back and played about in Bombay socially for four or five days, and then took the steamer home, he would not have done his duty?

Sir Courthope-Munroe.—Obviously.

Chairman.—That is your point?

Mr. Billimoria.—Yes.

Sir H. Courthope-Munroe.—It would be obviously ridiculous. You would then find he had not properly supervised. I would put it even higher. If a man undertakes to do work and is obviously guilty of gross negligence in the work, he is not supervising it—he is not doing his job.

Chairman.—That meets your point?

Mr. Billimoria.—Yes.

Sir H. Courthope-Munroe.—I am very glad that question should have been put to me so that I may endeavour to meet it. Now let me go to paragraph 2: "If the Government of Bombay shall from time to time require any alterations in the works before or after the commencement thereof or shall require any additional works to be executed, all work required to be done in connection therewith shall be in the duty of the firm under the preceding clause." I do not think there is any dispute about that.

Chairman.—You had better make the point that I take it your construction of that is that the work is work of supervision. All work required to be done is work of supervision, is it not?

Sir H. Courthope-Munroe.—Yes, I think so.

Chairman.—That is if they throw in any additional work, the same duty applies as regards the additional work as applies to the original work?

Sir H. Courthope-Munroe.—Exactly. Whatever that duty may be, the same duty applies to the additional work.

Chairman.—To see what it is you have to refer to the preceding clause.

Sir H. Courthope-Munroe.—I agree. Now I come to the next clause, where we really get down to the real point.

Sir Frederick Hopkinson.—Where the moorum is.

Sir H. Courthope-Munroe.—It is a matter which one has very carefully to consider. Before I read this I ask the Committee to strongly bear in mind the ordinary position of a Resident Engineer, with which no one is better familiar than Sir Frederick Hopkinson. This is paragraph 3: " A Resident Engineer and also a Deputy Resident Engineer (if required, and if his appointment is approved by the Government of Bombay) will be nominated by the firm and will carry out the details of the works in accordance with the firm's instructions, but subject to the control of the Director of Development or other officer appointed by the Government of Bombay, and they, as well as the whole of the staff, both engineering and clerical, employed in India in connection with the works, will be paid by the Government in Bombay." Let us tackle that bit by bit. As I ventured to point out, there is no obligation put in the agreement upon Sir George to nominate or be responsible for anybody at all except the Resident Engineer and the Deputy Resident Engineer. In point of fact he nominated Mr. Lewis. Having said that I pass from that because we have discussed all that. Also he nominated the Deputy Resident Engineer, Mr. Elgee.

Chairman.—Mr. Brims and Mr. Elgee.

Sir H. Courthope-Munroe.—He was to nominate these two people. In point of fact he did nominate these two people. Then Mr. Lewis fell out and he nominated a third man to be Deputy Resident Engineer.

Chairman.—He did not nominate Mr. Elgee. What happened was, he put an advertisement in " The Times " at the request of the Director of Development, and Mr. Elgee replied. There were several other applicants. Sir George Buchanan, having read all the applications, said he thought Mr. Elgee was the best man, and in that way the matter went through.

Sir H. Courthope-Munroe.—If you please, I do not want to stress it or labour it in any way, but I want to meet the suggestion that every person that Sir George Buchanan may have recommended and said " He is the right man " he is, from beginning to end, responsible for. According to the law—and here one again gets it from Hudson—the mere nomination of a man, if you honestly nominate him and are acting in good faith and not in bad faith, is an end of the matter—there is no legal obligation in fact in any shape or form. In this case an attempt is being made, if I follow the matter rightly, to suggest that all these actions which were done out of mere good nature and an endeavour to advance things were all actions for which Sir George is liable down to the bitter end.

Chairman.—What are you referring to when you say " all these actions "?

Sir H. Courthope-Munroe.—I cannot get out of my head what Sir Frederick is putting to him when he said, taking the crew that came out from London: " You ought to have known them all." I suggest that nomination does not involve a knowledge of the crew, but I may have misunderstood Sir Frederick.

Chairman.—I think that the particular point that Sir Frederick Hopkinson was on is this: the whole scheme hinged on the pumping hours being 15 hours a day.

Sir H. Courthope-Munroe.—Good.

Chairman.—Sir George Buchanan in his report had said that two shifts should be worked. I do not think Sir Frederick Hopkinson's questions were directed to anything more than pointing out that Sir George Buchanan must have known there were not two shifts being employed, because the personnel had not been engaged. That is it, is it not?

Sir Frederick Hopkinson.—That is it.

Chairman.—That is all; you need not labour that.

Sir Frederick Hopkinson.—That is all I meant.

Chairman.—When you get to the third line of this clause then we get to grips in the matter.

Sir H. Courthope-Munroe.—" And will carry out the details of the works in accordance with the firm's instructions." There this agreement is in exact accord with what Lord Lloyd said. It is in exact accord with the document that I read to you, which is the scheme. Who is to carry it out? A multitude of questions have been put, all perfectly good questions if put to the right person, but, being put to Sir George, they have astonished me. The person to carry out the details if the work is the Director of Development.

Chairman.—The Resident Engineer, according to this?

Sir H. Courthope-Munroe.—Yes, the Resident Engineer, but under the control of the Director. You will see that a little later on. I am not here in any sense palliating all this wicked waste of money that has gone on, and the gross neglect, but what I do respectfully suggest is, that it is monstrous in the terms of this paragraph 3 to lay this at the feet of Sir George. The Resident Engineer and also the Deputy Resident Engineer " will carry out the details of the works."

Sir Frederick Hopkinson.—As instructed by the Chief Engineer. It is the Engineer's instructions.

Sir H. Courthope-Munroe.—" In accordance with the firm's instructions." Look at this extraordinary document. It is : " in accordance with the firm's instructions, but subject to the control of the Director of Development." Getting back to our dictionary, what does " control " mean—" restraint on the free will." Can one conceive a document like this?

Mr. Billimoria.—But that " control " does not mean that; that " control " means the administrative control, which is entirely different from the engineering control.

Sir H. Courthope-Munroe.—Let me try and answer that suggestion. I refer again to what Sir Frederick Hopkinson said, which was very apt—that there is no engineering in the actual work of the dredging. You have to buy the dredger, as he aptly pointed out, and that is all. We do not want a gentleman from London with high qualifications to come out to work the dredger. There is no engineering in it. It must be common ground that that is detail. If so, the party to carry out that job is, on the very terms of the contract, the Resident Engineer, subject to the instructions of the firm. What instructions are you going to have in the work of the dredger, or in cleaning out the quarry, or in cutting stone? Is that a job for a gentleman of the eminence of Sir George Buchanan? Surely not. When you say " the firm's instructions," I am not quarrelling with your putting it to me " the firm's instructions are to be given and they are to be subject to the control of the Director," but " control " is restraint of free will. What has happened in a case of this kind? Instructions are sent out to do this, that and the other. The Resident Engineer, Lewis, is in no sense a servant or watch-dog, or representative of the principal Engineer. He is body and soul handed over to the Director. Suppose he says, " I have the control of you, and do not do it," what then?

Sir Frederick Hopkinson.—Does not that cause an explosion at once?

Sir H. Courthope-Munroe.—It ought to, I agree; but if people make these documents, what is the principal Engineer to do?

Sir Frederick Hopkinson.—Your profession made that document, not mine.

Mr. Billimoria.—Do not you think that the word " control " naturally implies administrative control, and not engineering control?

Sir H. Courthope-Munroe.—I am talking about administrative control.

Mr. Billimoria.—If there is administrative control, that does not debar the firm's instructions from being carried out. That may only mean not paying out so many pounds, shillings or pence with regard to a certain item. That is all the control that is meant there.

Sir H. Courthope-Munroe.—I want to try and meet the point if I can; but I am afraid I do not follow you. Here is this detailed work being made a ghastly mess of by reason of the conduct of these pepole who are in charge of it. They have to look after it. They are in charge of the details, and they are under the control of the Director. How, on the true construction of this clause, can you possibly say that the principal Engineer, who, mark you (and I again go back to this) starts off by being employed as the Engineer, not as the dredger-master, not as the quarry-worker, not as the clerk of the works, but as the Engineer——

Sir Frederick Hopkinson.—But the Engineer to control all the others you mention.

Sir H. Courthope-Munroe.—Having got your Engineer, your primary duty would be in ordinary practice to control : and whom would you control?—the very first man would be the Resident Engineer. But here you take away the watch-dog. You lock him up, and you refuse to give him an independent man, and you say : " I am going to have sole control." Then all this happens; and you turn round and say : " Now this is your job, you the principal Engineer." I want seriously to meet your point; and I hope I have done it.

Mr. Billimoria.—But you must read paragraph 1 " as he may consider necessary to ensure the complete and satisfactory supervision of the works." Those words " to ensure the complete and satisfactory supervision of the works," have a special bearing

on the subject. Then it says in paragraph 3 : " The Resident Engineer will carry out the details of the work in accordance with the firm's instructions."

Sir H. Courthope-Munroe.—Quite so. I am obliged to you. Looking at this paragraph, we are deaing with the substance, that paragraph is directed to what Sir George is to do when he is in India, and as to his remaining there. This fiasco of the dredging work was not going on just the few weeks that he was there inspecting and what not, but it has been going on for years. Look at what I referred to yesterday. You have 2¼ years with a man in charge of the work who apparently ought not to have been in charge of anything. It is his misfortune, may be, but there it is. This Clause does not touch that. It deals with the question that he is to remain in Bombay such period as he honestly thinks sufficient, and as the Government may properly require, for the purpose of ensuring the complete and satisfactory supervision of the works. But it is right beside the point we are now discussing. It has been said again and again, and I entirely agree with it—Sir Frederick has said it, and everybody has said it—that the crux of the Inquiry is the dredging. Whether or not it was proper dredging obviously is a matter on which most exhaustive questions were put to Sir George. But the working of the dredgers, upon this agreement, is a matter which can in no sense be laid at his door. You remember the letter I referred to yesterday. I again point out that he had no power to dismiss Lewis himself. He had no power to deal with him at all. All he could do was to do what he did do. He was a voice crying in the wilderness for 2¼ years. In the instrument you have got this word " control." No doubt that is why Sir Grimwood said it was a curious condition to construe. Here you put up a man to do this, who in the normal course of things would be the servant, the *alter ego* and the eyes of the Engineer, and you put him absolutely in control of the contractor, or the person who is in that position. What can you expect? Your short-circuit every check that you would normally have in an ordinary case. In the ordinary way a man cannot get his money except by it going through the Resident Engineer and the principal Engineer. You short-circuit that; you make the employer the contractor. You get these Comic Opera or fairy-tale sort of estimates that were going on. What could the unfortunate principal Engineer do? It has been said by Sir Frederick Hopkinson, and one as things go can understand it, being wise after the event : " Why did he not put his hat on and go? Why did he not make representations to the proper Authority? " That is all very well, and at this stage it my be a fair observation to make. But Sir George had undertaken to carry out these works. What right had he to break his contract and pack up and go? He would have rendered himself liable to an action, if he had done it; and he would have done the very thing which the people who were on the spot would have been very glad to see him do. If he had done that, what would they have said? They would have said : " Look at the muddle he has got into, and now he has bolted." They would have said that for a certainty. I do not say, in the events which have happened, that people might not make the suggestions made by Sir Frederick; but if he had done that, then it would have been an end of Sir George. They would have said : " Look at the ghastly muddle that he has made in the state of affairs, and he has packed up and gone."

Chairman.—I do not quite agree. Suppose he had gone to the Governor, having prepared most careful memoranda; the Governor was deeply concerned with the success of this matter.

Sir H. Courthope-Munroe.—I agree.

Chairman.—Sir Leslie Wilson was just as much concerned as Lord Lloyd, although Sir Leslie Wilson had no responsibility for the initiation of the scheme. But he has, and would have the deepest interest in it, as a thing for the advantage of Bombay.

Sir H. Courthope-Munroe.—Good.

Chairman.—Sir George would have received the most sympathetic hearing from either Lord Lloyd or Sir Leslie Wilson. The mere intimation that his position had become impossible would have resulted in Lord Lloyd or Sir Leslie Wilson calling everybody before him, and there would have been a complete sweep up of the people who would not do their duty. It would never have got to resignation on the part of Sir George Buchanan; but he could have said : " Well, if there is not a clean sweep, then I must go;" and he would have gone under conditions which would not have rendered him subject to any criticism at all.

Sir H. Courthope-Munroe.—As I say, I can quite understand at this stage one feeling that.

Chairman.—That is how it strikes me.

Sir H. Courthope-Munroe.—I only want to say to you that there is another side to it. It might well have been said, if he had done what I respectfully suggest was a counsel of perfection : " You are a man of sense; you have made an agreement. You have carried it out. What do you mean? There is all this muddle. Now you have bolted."

Chairman.—It would not have been done in that way. It would have been done in a much more formal manner.

Sir Frederick Hopkinson.—You have to remember in these things individuals do not matter at all, it is the work that matters—the end.

Sir H. Courthope-Munroe.—I agree. I am entirely with you there. The only thing I want to say, and say again, is that this Committee has, as I respectfully suggest, to consider the conduct of this scheme. That must mean the conduct of A, B, C, D or E. My only complaint, if I may venture to make it, is that all this amount of wrong-doing has been laid against the door of sundry people. Anything that is within Sir George's purview I make no complaint about his being attacked mercilessly; but I do object to his being attacked for a number of things for which he has no more responsibility than I have. That is my point and my only point.

Chairman.—I am not content with what has been said at present about Clause 3. and I would like to put it in my way.

Sir H. Courthope-Munroe.—If you would kindly do so, I should be indebted to you.

Chairman.—I will. The middle part of the clause is: "And will carry out the details of the works in accordance with the firm's instructions." That is the point I want to discuss. Supposing it had run like this: That the firm will prepare a carefully considered programme, exact in all necessary details, and will communicate that programme with its details to the Resident Engineer, who will carry out the detail of the work—does it mean more than that? The extreme view is that the firm are to prepare details; they are to communicate those to the Resident Engineer; they are to instruct him to get on with those details, and instruct him to do them. For example, a letter from Meik & Buchanan to Lewis saying between October and December 1,600 tons of concrete are to be built into the sea-wall is a detail. Lewis, according to this, has got to do that. But if you turn to the fourth line, it is "subject to the control of the Director of Development."

Sir H. Courthope-Munroe.—Yes.

Chairman.—The Director of Development might say: "The price of cement is going up very high. Instead of 1,600 tons being put into that, I think 900 will do."

Sir H. Courthope-Munroe.—That is it.

Chairman.—It becomes unworkable.

Sir H. Courthope-Munroe.—That is my difficulty.

Mr. Billimoria.—Has it really become unworkable? Are there any instances in which the Director of Development has interfered and turned down the instructions of the firm? The Committee would very much welcome that evidence..

Chairman.—There is no evidence of his having done that.

Sir Frederick Hopkinson.—There is only one instance.

Chairman.—I am speaking very carefully, according to the way Mr. Billimoria puts it. There is no instance of that. There is only one instance where in February, 1925, they began the sealing of the sea-wall.

Mr. Billimoria.—That is quite right.

Chairman.—There has been no instance of the Engineers having put forward any scheme, having suggested any details, and Sir Lawless Hepper having stepped in and negatived them.

Mr. Billimoria.—No.

Chairman.—There has been no evidence of that.

Sir H. Courthope-Munroe.—No; and I do not want to put my case too high.

Mr. Billimoria.—Even with regard to that one item, Sir George Buchanan subsequently gave his approval to the action of the Development Directorate with regard to the sealing of the sea-wall. So if you are laying emphasis on "subject to the control of the Director of Development," I do not see where it comes in.

Chairman.—The fact that the Director of Development did not intervene does not really matter, if he had the power to intervene. He was given that power.

Sir H. Courthope-Munroe.—May I just read again three lines of what Lord Lloyd said: "He was a watch-dog. It was his duty to see that the organisation was working efficiently and economically." You see that, and then you say that Sir George is the man who ought to have done that. That is what I am endeavouring to meet.

Mr. Billimoria.—That is where supervision comes in.

Sir H. Courthope-Munroe.—I take that language to mean it was his duty. It was the duty of the Director to see that the organisation was working efficiently and working economically. Now it is said: "We find in the agreement somewhere that that

duty was not as Lord Lloyd said it was, the duty of the Director, but it was the duty of Sir George. What does he mean by not doing it?" Then I turn to the agreement and I say: "It does not say anything of the kind."

Mr. Billimoria.—Supposing there was inefficiency and want of economy on the part of the Director of Development, Sir George could come in with regard to supervision under the words "to ensure the complete and satisfactory supervision of the work."

Sir H. Courthope-Munroe.—I thought I had killed that. You are back on clause 1. That only deals with what he is to do the short time that he is in India; that does not control the whole of the agreement.

Sir Frederick Hopkinson.—But "supervision" surely means more than looking at a thing. It means satisfactory supervision.

Sir H. Courthope-Munroe.—I am not suggesting it does not.

Sir Frederick Hopkinson.—Supervision is seeing it is carried out economically and well.

Mr. Billimoria.—The words are still stronger in paragraph 1: "The firm agree to act as the Engineers of the Secretary of State in carrying out the said scheme and in the construction and execution of all works connected therewith."

Sir H. Courthope-Munroe.—Yes, as Engineers.

Mr. Billimoria.—As "the Engineers."

Sir H. Courthope-Munroe.—You have got the duty of the Engineers defined to be carried out as the general practical professional duty of Engineers within the four corners of this document. I do not want to escape from that for a moment; but what I say is: I did not undertake to act as quarry-master, and I did not undertake to work the dredgers.

Sir Frederick Hopkinson.—Yes, you did—you undertook to supervise it.

Sir H. Courthope-Munroe.—With great respect, that is a matter of opinion.

Sir Frederick Hopkinson.—You undertook to supervise it, did you not?

Sir H. Courthope-Munroe.—There again I say "supervise" is the word that is used in all these contracts; but it does not amount to superintending the details.

Sir Frederick Hopkinson.—It must have some practical meaning, must it not—something that is going to result in something?

Sir H. Courthope-Munroe.—As a man of business I am with you; but I am now speaking as a lawyer on this agreement.

Sir Frederick Hopkinson.—I thought they were both the same.

Sir H. Courthope-Munroe.—I cannot quarrel about that, but it is suggested that the effect of this agreement was to convert a person of Sir George's eminence in the engineering world into a Clerk of the Works, and a hundred-and-one other things. He will be charged with neglecting the duty of the office boy if it is put as high as that. He may, if you please, be responsible for what he has done wrong and what he has contracted to do if anything is wrong; but do not elaborate against him a hundred-and-one charges in a capacity for which he has no responsibility whatever. That is my point.

Chairman.—Clause 3 is the only thing which troubles me very much. I understand the rest of the agreement—at least, I think I do—but I do not understand Clause 3. Supposing under Clause 3 Sir George Buchanan was able to say: "I nominated a resident engineer. I gave him instructions as regards the details," had he any greater responsibility than that? "I nominated the resident engineer and I gave him instructions as regards the way in which the details of the work should be carried out. If Mr. Lewis did not carry them out, I, Sir George Buchanan, am not in any way to blame for that."

Sir H. Courthope-Munroe.—That is the way I venture to put it.

Chairman.—If that is the explanation then my difficulty goes. Where is the responsibility for Lewis carrying out the details of the work as an agent for Sir George Buchanan?

Sir H. Courthope-Munroe.—In that connection I want to call attention to a remark which was made by you which struck me at the moment as very apposite. You said this after we had a long discussion: "I think the real position was that Sir Lawless Hepper left it to Sir George Buchanan, and Sir George Buchanan left it to Sir Lawless Hepper, and therefore, relatively nothing was done." I think there you probably put your finger exactly on the spot; but what I want to say about that is this. If it was Sir Lawless Hepper's duty under the scheme, if you accept what Lord Lloyd has said, and you accept the reading of the agreement which I have put, there was nothing wrong legally or morally in Sir George Buchanan's leaving Sir Lawless Hepper, the watch-dog, to do his own work. That is my point. I think the Chairman

has put his finger exactly on the spot there, but no moral blame can be attached to me for leaving other people to do their own work.

Mr. Billimoria.—You do not accept the position that the resident engineer was the agent of Messrs. Meik and Buchanan in India?

Sir H. Courthope-Munroe.—That is the whole crux.

Mr. Billimoria.—Except in regard to the payment of his remuneration.

Sir H. Courthope-Munroe.—No.

Mr. Billimoria.—You say he was not the agent of the firm?

Sir H. Courthope-Munroe.—No; that is what I am hammering at for all I am worth. This contract was a departure from every other contract that I have come across, except where you have a Works Department, which ends in this sort of thing. In the ordinary contract which I put of an engineer in London, if you were to suggest in Westminster to a principal engineer that he would be responsible for the work of the resident engineer without any condition that the resident engineer was dismissable by him or controllable by him, but his reports were to go direct to someone else, a big engineer would not look at it. But when you are dealing with Governments you are in a different position, and you hope for the best. If Lord Lloyd had remained on things might have been different. That is the whole position. That brings us back at once to Clause 3, which is the root cause of the whole trouble, which takes the man who is naturally the watch-dog of the principal engineer, the man whom he relies on, his eyes, and, as I said a little time ago, his other self, and puts him absolutely in the pocket of the people concerned, the Development Directorate, and it short-circuits all control over money and all guarantee as to the value of the work. That is the difficulty. Then at the eleventh hour when this ghastly mess has arisen you turn round and say: "What about the principal engineer?" That is my trouble.

Chairman.—It is very difficult to say that Mr. Lewis was the agent of Sir George Buchanan when Sir George Buchanan could not dismiss him.

Sir H. Courthope-Munroe.—And it is in the evidence, or Sir George will tell you if it is not, that at one stage when he was writing and complaining, he asked to have a resident engineer of his own, and the Government would not have it and would not pay.

Chairman.—It broke down on the question of money.

Sir H. Courthope-Munroe.—That is it.

Chairman.—I do not think there is any harm in my saying my view at the present moment is that if Sir George were being challenged on Clause 3 it would be sufficient for him to say: "I nominated a resident engineer. I gave instructions to him as to the detailed method in which the works should be carried out. That was all I had to do except for my duty of supervision. As regards that work I had no further or other responsibility towards the resident engineer."

Sir H. Courthope-Munroe.—That is all I am anxious to call attention to.

Mr. Billimoria.—That cannot be the position. Supposing I employ one of my clerks to carry out a certain job and I give him definite instructions to do it. If he fails or if he is negligent, who is responsible? Not the clerk, but I.

Sir H. Courthope-Munroe.—Because you can sack him. That is the answer.

Chairman.—He was your servant.

Sir H. Courthope-Munroe.—He was your servant. You pay him and you can sack him when you wish.

Chairman.—You pay him. He was under contract with you, and you had the power to come down and turn him away at once.

Mr. Billimoria.—Supposing I do not pay him, but my client undertakes to pay me for whatever assistant I employ in that firm to carry out the job under my instructions and under my supervision. If that clerk still fails I would be responsible and not the clerk.

Sir H. Courthope-Munroe.—Certainly. That is the ordinary case I am trying to put to you. In the ordinary case of a resident engineer in big practice, in nine cases out of ten he is paid direct by the building owner. In some cases it is added to the salary of the principal engineer and he pays it; but that is quite immaterial. The resident engineer is employed by and dismissable by the principal engineer. That is the case you put. That is the whole thing. The mere fact of whether the payment goes direct to him or by addition to the fee of the principal engineer is quite immaterial.

Sir Frederick Hopkinson.—Would that apply in the case of a Government Department where the head of the Department has no power to dismiss those under him, but he has to take responsibility for what they do?

Chairman.—Heads of Departments frequently find themselves in a difficult position.

Sir H. Courthope-Munroe.—That is a departmental matter that I cannot discuss. If it works out as you suggest that may create an injustice; but I am only concerned with the gentleman on the other side of the hedge.

Sir M. Visvesvaraya.—This is the work of two parties. One was the Development Director and the other was the engineer. It was expected they would work in unison. If the engineer, having been in that position, thought he was not free to fulfil the terms of the contract, he should have made his position clear at every stage instead of allowing matters to drift.

Sir H. Courthope-Munroe.—That is the difficulty. The man who was in control was Lewis. If Lewis, as in the ordinary case, had been the servant of the principal engineer he could have dismissed him, and the whole responsibility would very properly have been laid at the door of Sir George. In fact, it would never have arisen because 2½ years ago the man would have been sacked. That is the answer to it. There it is. It is one of those things that happen when once you get this sort of Department. My memory goes back a long time, some 45 years, and I have a sort of recollection that 30 years ago there was something very similar in London. The chain was broken and you got this direct connection between the building owner and the contractor, and money simply ran to waste.

Mr. Billimoria.—With reference to the point you have raised, might I draw your attention to the letter dated the 22nd June, 1921, at page 13 of the book of correspondence? It is a letter written by Sir George Buchanan to Mr. Lewis: " I pointed out that our responsibility did not cease then as we were not only the engineers for the machinery, but for the execution of the entire work ". Does not that state that Mr. Lewis was under Sir George Buchanan's control absolutely, and that Sir George Buchanan himself admitted responsibility in regard to the execution of the work?

Sir H. Courthope-Munroe.—Are you asking me that as a lawyer, or as a man in the street?

Mr. Billimoria.—So far as these documents go.

Sir H. Courthope-Munroe.—The inquiry has now reached a stage when one has got to look at what were the obligations and duties of Sir George, and what were the duties and obligations of certain other parties. Doubtless throughout the correspondence you can find such expressions and statements. Sir M. Visvesvaraya pointed out that the Government did not accept the view which is put forward there. I agree that for what it is worth, there it is; but ultimately, when you come back to consider the very grave questions you have to deal with you must get back to the actual document and the actual agreement. I agree that on reading that you may say: " Here is a man hanging himself ".

Sir Frederick Hopkinson.—You must admit the circumstances that we are considering now are different from those where you are bringing an action for damages, are they not?

Sir H. Courthope-Munroe.—Yes; very difficult. It is entirely different. We are not on that at all. Mr. Billimoria is fully justified in puting that to me. There is the letter. But one knows that in the course of business correspondence a man very often inflates himself and calls himself this, that, and the other, as to which when you come to deal with it you find he is not anything of the kind.

Mr. Billimoria.—I think I could point out several other letters.

Sir H. Courthope-Munroe.—No doubt you and I could point out some.

Chairman.—I do not think there is any other letter which says in such plain terms: " Responsible for the examination of the work ". They have said " We are engineers responsible for the scheme ".

Sir M. Visvesvaraya.—And the execution.

Chairman.—Then let me have that because I have not got it, and I should like to have it.

Sir H. Courthope-Munroe.—That really is only paraphrasing this other one that we have been on: " Execution of the works but answerable " what as—as the engineers?

Mr. Billimoria.—There are several letters. There is one at page 55: " We are appointed the engineers in carrying out the scheme, and all the construction and execution of all the works connected therewith until their final completion ". That is a letter written by Messrs. Meik and Buchanan dated the 3rd June, 1922, to the chief engineer.

Sir M. Visvesvaraya.—On the 22nd July they say: " We are the actual responsible engineers ".

Chairman.—I remember that phrase.

Mr. Billimoria.—It is at page 55 : " In the execution of the works." Then on page 54 come the words: " We are the engineers responsible to the Government of Bombay and the Secretary of State." There are several letters like that, if you wish to refer to them.

Sir H. Courthope-Munroe.—A possible explanation occurs to me, that this exaggeration of the position may have been attempted by Sir George with a view of trying to get a control that he had not got. Still, as I say, this is a little off the line of argument. The question is this. You have to consider what is the true position. The true position, in fact, is the true position in law.

Chairman.—You had better explain a principle that you and I are very familiar with, which is this : When a document comes before the Court for construction it does not really matter what the parties have said. Suppose in a letter a man has written with regard to a certain document that it puts such-and-such an obligation on him, when the matter somes before a court of law for the construction of that document, you have to look at the document and see what obligations arise from the document, and not take the expression of opinion of the people who are concerned. A man may make most disadvantageous statements in a letter about the document, but the Court may say : " Oh, no, that was not the meaning of it all." The extent of the obligation must be gathered from the document itself, not from what the parties thought that it meant.

Sir H. Courthope-Munroe.—Quite so. I hesitated to address you on that because one knows that you know that better than I do. But, bearing in mind that there are other members of the Committee who are not lawyers, obviously that is so. You have to have regard to the document, construing it from the actual words used.

Sir Frederick Hopkinson.—And what is the obvious intention of it, and what is the obvious meaning of the two parties, so far as we can arrive at it.

Sir H. Courthope-Munroe.—Yes; but may I add that the meaning is to be gathered within the four corners of the document, not what you and I as men of the world may say that the parties meant? That is the trouble.

Mr. Billimoria.—I quite agree with the Chairman, but may I point out that before the document takes birth, if there are any conversations or interviews on which this document has been based, that is to be treated as the foundation to imply the meaning of several Clauses in the document?

Sir H. Courthope-Munroe.—No. For the purposes of this enquiry I am prepared to go with you, but as a matter of law I venture to say that that is not material.

Mr. Billimoria.—That is often said in a court of law.

Sir H. Courthope-Munroe.—If you were in a court of law on a question of damages, and you were proving the matter before the court of law, it would be simply this document and nothing else. You would not be allowed to look at what somebody said before the document. You could not go into that at all.

Sir Frederick Hopkinson.—That is why I said this enquiry is different from a case of bringing an action for damages.

Sir H. Courthope-Munroe.—It is; but the strong point I want to make is this : If you examine all the earlier history, if you examine the scheme, if you read what Lord Lloyd said was intended, if you follow what the agreement actually did, it all works in the same way. It was intended not, of course, to produce these results, but it was intended that the control and direction of the work, the smooth running and efficient working of it should be with Sir Lawless Hepper. It has been disastrous. You will hear from Sir George now if he were called upon to say which it should be, contract or Government work, he would plump for contractor's work straight away. In fact, he said so. But the intention of everybody at the start was to put the designing of the work with Messrs. Meik & Buchanan, and the carrying out of the work with the chief engineer. The director was responsible for the smooth and economical working, and also for obtaining the plant, subject to specification. That was all intended, and the agreement does it. In the events which have happened in India, apparently, when this disastrous state of things came about a scapegoat was wanted.

Mr. Billimoria.—The agreement goes further than that, because the agreement says : " shall at all times assist and advise the Government of Bombay."

Sir H. Courthope-Munroe.—That is what he was to do : to assist and advise and supervise. But the gravamen of the charges against him, in point of fact, is that he did not superintend all these details, which was somebody else's job.

Chairman.—I am not at all sure that that was any part of his duty.

Sir H. Courthope-Munroe.—That is my trouble.

Chairman.—That is the actual execution of the work in Bombay. It was his duty to advise on, and supervise, these works, but I am not at all sure how far that goes.

Sir H. Courthope-Munroe.—I do not quarrel with any of the questions put to, or the attacks made upon, Sir George Buchanan with reference to his design or his estimates, or those sort of things, but with regard to all this odd work such as the Kandivli Quarry, the dredger, the making of these cross-bunds, all the local work and all this mass of detail in regard to which the greater part of the trouble has arisen, I do say it is altogether wrong to lay it at Sir George's door. That is what I want to emphasise in connection with the agreement. I do not think there is very much more I need say in connection with the agreement.

Chairman.—No, I think that practically exhausts the agreement.

Sir H. Courthope-Munroe.—Paragraph 4 only deals with the question of the payment, which is not in dispute.

Chairman.—My difficulty is this: I cannot understand how any man would have accepted responsibility for the execution of works unless that man was going to be on the spot the whole of the time, or unless he had somebody there in whom he had the most implicit confidence. It seems to me heading for disaster otherwise.

Sir H. Courthope-Munroe.—I am not prepared to answer that. All I can say is that Sir George was acting in this case under the aegis of Lord Lloyd, and he did not realise that Lord Lloyd's day would come to an end sometime.

Sir M. Visvesvaraya.—Two or three people were jointly concerned. It was the team-work which failed. And all this disaster has resulted from that. It was the business of every member of the team to insist that he was given his share of the work according to the terms of his contract. Did your client insist on that?

Sir H. Courthope-Munroe.—I am sorry, but I do not quite follow.

Sir M. Visvesvaraya.—According to the terms of the contract there were certain duties binding on your client, and he ought to have made sure that he had the necessary opportunities at every stage of the scheme for the performance of those duties. If he was missed out at any time he ought to have insisted on his opportunities being restored to him. What has happened seems to be this: An estimate was prepared. It was found under the mark. Then a revised estimate was prepared. The Government ignored him and prepared a separate estimate themselves. Detailed plans and estimates for the complete scheme were not prepared by your client. With regard to the dredger, the specifications were apparently unsatisfactory and faulty. Then when the dredger was built according to the specification and brought on the scene, it failed to give the promised output. When all this happened the local chief engineer eventually took over some of your client's duties, and his word prevailed over that of your client. That seems to be what has happened, and the responsibility must be on your client in not securing opportunities to fulfil the terms of his contract. I only put this view before you. What have you to say to it?

Sir H. Courthope-Munroe.—I cannot accept that. I think the utmost which could be put against my client is what the Chairman has just said. It is a wonder that a gentleman of his position put his hand to the document. I think that is a perfectly fair observation, but I cannot agree that there was any sort of responsibility upon Sir George. He was writing innumerable letters one after the other—to go back to Lewis.

Sir M. Visvesvaraya.—There have been innumerable letters, but we have not got one comprehensive memorandum which was put forward as a convincing argument that things were going wrong and that matters should be handled differently. If such a memorandum had been given to the Bombay Government, they would certainly have acted on it.

Sir H. Courthope-Munroe.—But can you, in fairness, extract that from the documents? Assume an extreme case. Assume you were satisfied for the moment that my client had done everything he had contracted to do within the four corners of this document. Could you then blame him because he had not done something outside the document?

Sir M. Visvesvaraya.—Many things have not been done within the terms of the document because he did not assert himself.

Sir H. Courthope-Munroe.—What is it which he bound himself to do under this contract that he has not done?

Sir M. Visvesvaraya.—For instance, detailed plans and specifications. Do you know, Sir Harry, that the sanctioned estimate which has been in operation since 1922, was not prepared by your client? Why is that?

Sir H. Courthope-Munroe.—I do not follow. If it is said that he ought to have prepared certain plans and that he has not done so, very well, then I should like to put

that to Sir George at once. I agree that if that is so, obviously it requires answering, but I say that he has done everything he contracted to do.

Sir M. Visvesvaraya.—There is one more question I want to put to you. The Government with whom you were under contract to carry out and help in this work——

Sir H. Courthope-Munroe.—Do not use the phrase " Carry out " ; I object to that.

Sir Visvesvaraya.—To carry out in association with the Government. It is team work. Many big works have to be carried out by several heads co-operating. That co-operation should have existed but did not exist here. The reason seems to be that in some cases the work done was not satisfactory and was not in sufficient detail for the people to follow, consequently they ignored the instructions and carried on in their own way.

Sir H. Courthope-Munroe.—I am not out to defend in any sense the want of co-operation. It is obvious that in a work of this kind only one result can happen if you do not have co-operation.

Sir M. Visvesvaraya.—If your client had prepared a complete memorandum of the situation at any stage and had offered it to Government, Government would have stopped the interference you complain of.

Sir H. Courthope-Munroe.—I am not prepared to controvert that. All I say on it, with very great respect to the Committee, is that it is rather a counsel of perfection. Can you call to mind any case where any one person has gone direct to Government and attacked a Government department and asked for their abolition?

Sir M. Visvesvaraya.—Many people have done that—Contractors usually do.

Sir H. Courthope-Munroe.—It is a big responsibility to suggest to a London engineer that because he is dissatisfied he has to invite a Government to wipe out an entire Government department. The result would have been that he would have been dead and buried by now.

Sir M. Visvesvaraya.—Under this contract the Department is one party and you, the engineers, are the other party. You have to work in unison. If you say " The other man prevented me from doing it; I have no authority; I cannot do anything," that will be an excuse, not a reason. You should go to the principal and say " This man is preventing me from carrying out my share of the work." If a convincing argument had been put forward in a memorandum, Government would have taken it up. What have you to say to that?

Chairman.—We are getting a little beyond the construction of the agreement now. We are getting in to the merits, and we had better not express opinions about them. Anyhow, that is how the thing stands. You have told us about this agreement. I think you misunderstood something I said if you thought that I said that I could not understand why Sir George Buchanan put his hand to this agreement. I did not say that. What I said was that I could not understand any man agreeing to be put into such a position that he would be responsible for the execution of the works—which is a very different thing.

Sir H. Courthope-Munroe.—I did not wish to put it too high, and I entirely agree with your view.

Chairman.—Suppose he is in England in May, and in May there is a complete breakdown of the Kandivli Quarry owing, if you like, to gross misbehaviour on the part of three or four people up there. Is he to be responsible for that? If when he said that he was appointed engineers in carrying out the scheme and in the construction and execution of all works connected therewith he meant he was taking the responsibility for the due execution of all works, I cannot understand his accepting that position. If he meant that as engineers he was responsible in all matters relating to the execution of the works, then I understand it.

Sir H. Courthope-Munroe.—I agree, Sir, but one cannot attempt to construe this agreement by reference to loose expressions in correspondence.

Sir Frederick Hopkinson.—Are we to draw any conclusion of any kind as regards to relations between the amount paid for the work done under this contract as to whether it could be held to cover bare supervision, or supervision and control. The amount paid is 2 per cent. on 700 lakhs, which is £105,000.

Sir H. Courthope-Munroe.—I am not going to discuss the question of quantum. That is a matter of the contract.

Chairman.—What Sir Frederick has in his mind is this—that an engineer employed to get out plans in a very big thing like 367 lakhs might be content with half per cent. or 1 per cent., but that if you are going to increase his responsibilities by putting on him duties that are wider than those ordinarily performed by engineers, you have got to increase his remuneration. I think Sir Frederick would like your view, or the opinion of Sir George Buchanan, whether the bargain to give him 2 per cent. on the 367 lakhs

did not imply that he had more duties to perform than would fall to the lot of the ordinary engineer.

Sir Frederick Hopkinson.—Under the narrow meaning of the word " supervision."

Sir H. Courthope-Munroe.—When I come to deal with the evidence I will put that, but as a lawyer I should say you cannot incorporate that into this agreement in any sense of the word. You would want a lot of expert evidence. Some people might say 2 per cent. was quite inadequate and that it ought to be 5 per cent. Look at the enquiry you would embark upon if you were going to construe this agreement by reference to the money mentioned in it.

Sir Frederick Hopkinson.—Happily I am not a lawyer.

Sir H. Courthope-Munroe.—You have the advantage of being an eminent contractor.

Chairman.—Does that conclude your argument on this point?

Sir H. Courthope-Munroe.—I am reminded by my friend of one other point which I wanted to make. In dealing with the agreement, I referred to what I called the modification of the agreement which is contained in a letter with an annexe to it of the 30th January, 1923. I said not quite accurately that I had exhausted the effect of that agreement by the insertion of those few words in paragraph 1A; but there is a point to which I want to draw your attention which is contained in paragraph C, the last paragraph of that modification, and it runs in this way: " The obligation which clause 1A of the agreement lays on the engineers to carry out certain work in London may, with a view to securing a workable arrangement, be held to be confined to the permanent works only of the reclamation, including the storm-water drains referred to in B." Now this is what I want to draw your attention to: " and in order to insure better co-ordination, all correspondence between the engineers and the Chief Engineer Reclamation Branch should in future be addressed through the Director of Development, a copy of each document being forwarded at the same time for record in the Director's Office." If anything was wanting to stamp the position that the resident engineer was, in no possible sense of the word, the servant of Sir George Buchanan, it is that. We are not even allowed to address him direct. We have got to address him through the Government Department and on one occasion when we did, after that, address him direct, we were hauled over the coals for doing so.

Mr. Billimoria.—Is not that a matter of convenience, or a matter of record, for the Government?

Sir H. Courthope-Munroe.—I am not complaining a bit about the Government action in doing it. That is entirely a matter for Government, but what I do say is that this emphasises beyond all question the position which I take up—that the effect of this document is entirely to remove the resident engineer from being in any sense of the word our servant or under our control. It is suggested that I should read the question to which this is an answer. The words of paragraph C on the preceding page are " and as to the relationship between Messrs. Meik and Buchanan on the one side and the Government and the Chief Engineer Reclamation Branch on the other." It was in answer to this question as to the relationship between the parties that at this stage in 1923 it was definitely stated that he was the servant of the Director of Development, and this provides that you shall not even write direct to him.

Mr. Billimoria.—That only meant that the Director of Development was a Post Office as between Sir George Buchanan and the resident engineer.

Sir H. Courthope-Munroe.—May I go back to the question you put to me about your clerk just now. He would not go through the operation of the Post Office. If he disobeyed your orders and got you into trouble you would get at him direct.

Sir Frederick Hopkinson.—It is a very common thing in Government works to have this Post Office system.

Sir H. Courthope-Munroe.—I do say that these two paragraphs emphasise the position which I say is the true construction of the agreement. I do not think, Sir, that I can usefully add anything to what I have said.

Chairman.—With regard to Monday, Monday is the last day on which we can have this room. You must get through then. You can get through most easily.

Sir H. Courthope-Munroe.—I think I may say I will do it.

Chairman.—I think we must do it.

Sir H. Courthope-Munroe.—I would only ask you to bear in mind that this is the 56th day, and that there were a large number of witnesses called in India, and some in London, and it is in consequence of the various things which were said in India that you have been good enough to allow me to intervene and deal with that evidence. You may take it from me that I shall be as brief as I possibly can.

Chairman.—I think you can manage it well within the compass of the day.

(*Adjourned to Monday, 15th November, at 11 a.m.*)

The Committee Assembled at 11 a.m. on the 15th November, 1926, all the Members being present.

Sir George Buchanan, recalled and further examined.

Sir H. Courthope-Munroe.—I think, Sir, I had better go straight to the Bombay evidence, and get through it as quickly as I can. You have made some extracts, Sir George, from the Bombay evidence, have you not?

A.—Yes, I have.

Q.—Just take the document in your hand, because it will conduce to my dealing with it fairly briefly. If I attempted to tackle the actual shorthand notes we should be here for another week. I will just go through the various points which you have extracted from the Bombay evidence, and in reference to which I think you desire to make comments and, in many cases, denials?

A.—Yes.

Q.—Is there anything in the first half-dozen pages with which you want specially to deal? Do not touch on anything we have discussed, because it is no good going over old ground again.

A.—No.

Q.—The evidence you are now dealing with is that of Captain Headlam. He is the first witness?

A.—Yes.

Q.—I see that the second witness is Sir Lawless Hepper. He is the important witness whose evidence you want to deal with in some detail. Is there anything you wish to mention until you come to page 7? Page 7 deals with the escape of material through the rubble wall.

A.—I should like to deny the allegation of Sir Lawless Hepper that I was of opinion that the scheme would prove to be a great financial success.

Q.—I was going to deal with that a little later on. I have that in mind, and I will mark it so as not to deal with it twice. On the following page there is a reference to the working of the dredger, but the Committee know all about that, and what your contention is. That brings us to page 7.

A.—I think we can pass page 7. All that has been dealt with.

Chairman.—Surely, Sir Harry, Sir George Buchanan has modelled his statement on the previous evidence which was sent to him from Bombay and received in England? You are surely not going over it page by page?

Sir H. Courthope-Munroe.—No. I particularly want to avoid doing anything like that, because obviously that would be a waste of time; but where witnesses have made statements which are in conflict with what Sir George says happened, or where they have said that Sir George has done certain things and said certain things which he says he did not do or say, I want to give him the opportunity of dealing with them.

Witness.—I think we can go on to page 14.

Sir H. Courthope-Munroe.—I think first of all you want to refer to some matters on page 11?

A.—Yes, I do.

Q.—Some questions were put by Sir Frederick Hopkinson to Sir Lawless Hepper. I see that Sir Frederick puts this question: "Therefore you are entirely responsible for the scheme as Director?" The answer given by Sir Lawless Hepper is: "I am not in any way responsible for the technical details of the scheme." Then Sir Frederick Hopkinson says: "For the design or the carrying out."—(A.) "No, I am not responsible." You wish to emphasise what I said on Saturday, and refer to the scheme itself?

A.—Yes.

Q.—Then it is said, "Who is?" and the answer is: "Sir George was." You deny that, for the reasons which I put in some detail on Saturday?

A.—Yes.

Q.—Then Sir Frederick asks: "Who is since he left?" He says that nothing has been said about that. "Do you mean there is no one in sole charge of the whole scheme?" Sir Frederick says: "I thought, as Director, you would have been responsible from the beginning." That, according to your view, is the true way of looking at it?

A.—He was responsible for carrying out the work.

Q.—Passing rapidly down that page, I see that Sir Frederick again comes forward and says: "Surely, as Director, you are responsible?" Then the answer is: "I have

always assumed that for the technical details Messrs. Meik & Buchanan have been responsible as engineers." I observe that that is the second time he has ridden off on the word " technical." A little lower down Sir Frederick Hopkinson puts it to him ; " They are purely the engineers? You have the sole responsibility. They act under your instructions," and then, for the third time he says: " No, not in technical matters. I have never considered I am competent to give them instructions in technical matters." Then Sir Fredericks says: " They sent their reports to you." That you did?

A.—Yes.

Q.—And then he says " Yes, every time Sir George Buchanan came out he made reports to the Government.—(A.) To you, or to the Government. It was all addressed to you." In answer to a question by Sir M. Visvesvaraya, Sir Lawless Hepper says: " Yes, I think it is addressed to me, but I have never assumed that I was in the position to dictate to them in any way as regards engineering technicalities." There we are, off for the fourth time on the word " technicality." Are you able to gather exactly what he means by that?

A.—I have nothing much to add to what you said on Saturday. He and his Chief Engineer were responsible for the technicalities in connection with the carrying out of the work.

Q.—But, as we have heard in this case, not once, but a dozen times, the major part of this affair which has caused the loss is the dredging, and Sir Frederick Hopkinson, as I pointed out on Saturday, made this very clear at page 59 of the meeting of the 3rd November, where he said: " But circumstances are not quite the same in that case and in Bombay. Take the dredging, for instance, which is the major part of the scheme in Bombay. There is no designing there, having once bought your dredger.—(A.) The actual designing required for the Back Bay work is very small.—(Q.) Is there any in the dredging work in Bombay.—(A.) No actual designing." Then there is a very pertinent question put by Sir Frederick: " Is there any engineering in it beyond buying the dredger—there are no plans to make.—(A.) There are no plans to make.—(Q.) There is nothing to supervise. All you have to do is to get your output?—(A.) All you have to do is to get your output.—(Q.) There is no engineering about it at all.—(A.) It is in the wall that there is engineering." If, as we have been told, that the major part of the affair which has caused the loss is the bad management and working of the dredger with regard to this point which Sir Lawless Hepper is making on four different occasions about not being answerable for technicalities, would this ordinary work of cleaning out the mud in this place be regarded as an engineering technicality, or not engineering at all, in your view?

A.—It all comes under the head——

Sir H. Courthope-Munroe.—Can you conceive anything which is less of an engineering technicality?

Chairman.—You would put it on the same ground as the Khandivli quarry, would you not? Is there any substantial difference between the excavation at Khandivli quarry and the excavating of the mud in the harbour?

A.—No, I should say they could be put on the same lines.

Sir H. Courthope-Munroe.—It is a little difficult to trace from this evidence what Sir Lawless Hepper did regard as his work. He kept on saying that the engineering technicalities were nothing to do with him. Could this main thing—the dredging—be in any case deemed to be an engineering technicality?

A.—He was responsible for all the administrative work in connection with the dredgers—putting them on double time, the paying of bonuses, and generally seeing that everything was done by proper team work.

Q.—Let me go to one other matter of some little importance. I will turn to page 14 of your extracts. This question was put to you by Sir Frederick Hopkinson, "Did you in fact get tenders for building the wall? " You say, " Tenders were called for for the first 8,000 feet from Colaba.—(Q.) On what date.—(A.) It was, I think, December 1920, or January 1921, very soon after the work started.—(Q.) Sir George Buchanan says on 7th February he was not in favour of accepting any tender." I think you dealt with that on page 92 of your statement.?

Chairman.—Yes, we have all that in the statement. Is there any new fact, Sir George, which you want to add now which is not in your statement, because we know your statement?

A.—No ; there is no new fact which is not in my statement.

Sir H. Courthope-Munroe.—You were in favour, at the start, of the matter being put out for contract?

Chairman.—He said definitely that he strongly wished Colonel Grisewood to have the contract ; that Lord Lloyd wanted him to have the contract, and that if the contract

had been given out to Colonel Grisewood, the work would have been begun in October, 1920. We know all that.

Witness.—Excuse me, Mr. Chairman, but Colonel Grisewood's tender was in October, 1920. This Colaba contract was another matter altogether.

Chairman.—A later one.

Sir H. Courthope-Munroe.—What I was coming to was this. Sir Frederick Hopkinson put this question to you about these tenders: " It is a fact, is it not, as appears from your evidence on page 92, that the tenders were received from Messrs. Pauling & Co., Messrs. Pearson & Co., and the Indian Construction Company "—that is Colonel Grisewood's firm to whom the Chairman has referred?

A.—Yes.

Q.—What I want to ask you on this point is this. It was put by Sir Frederick to Sir Lawless Hepper. He says this: " Actual tenders were asked for in 1920. I cannot give you the exact date. I believe tenders were sent in. I think there were about six tenders." Then he says, " And declined by Sir George Buchanan on February 7th," and Sir Lawless Hepper answers, I fancy somewhat ingenuously, " Yes." I think in that connection you wish to refer, do you not, to a note which you have found in your diary?

A.—Yes, I am producing that.

Q.—What happened was this, was it not? When these tenders were sent in you, Sir Lawless Hepper the Director of Development, and the Resident Engineer, Mr. Lewis, all met and discussed this matter?

A.—We did.

Q.—And then, having come to a decision, or, rather, having thought the matter over, you met again and had another consideration, and it was at that second meeting that the whole three of you came to the conclusion that, in the best interests of the work and of economy, it should not be done by contract?

A.—Yes.

Q.—Is it wholly misleading to suggest here that you, having got these contracts, of your own turned them down?

A.—It is wholly misleading. The extract from my diary says, " 8th February, 1921. Meeting with Hepper at 11 a.m. to discuss the tenders for Colaba contract. Lewis present, and all agreed it should be departmental."

Chairman.—You have already told us that.

Sir H. Courthope-Munroe.—I am sorry. It is not as I read it, and it is on the notes of the Bombay evidence.

Chairman.—Sir George Buchanan, since he came into this room, has referred to that in most definite terms. I knew that.

Sir H. Courthope-Munroe.—I did not appreciate it. It seemed to me that it stood that Sir George had done that.

Chairman.—No. He has already told us about it.

Sir H. Courthope-Munroe.—If that is so I will pass from it at once. While we are on this, let me clear up one other matter in connection with the tenders, and that is the tender for the dredger. I will take it quite shortly. Can there be any two opinions, Sir George, that Messrs. Simons, as dredger builders, are an eminent firm?

A.—No.

Q.—They are a well-known firm?

A.—They are a well-known firm.

Q.—You invited tenders, I think, and you got them from, how many people?

A.—The actual comparison which Mr. Meik prepared was that between Simons and Lobnitz.

Q.—Were they the only two it went out to?

A.—No, it went out to Fleming and Ferguson and Ferguson Brothers.

Q.—Tenders were asked for from Simons, Lobnitz, and who else?

A.—Fleming, and Ferguson and Ferguson Brothers—four firms.

Q.—On Friday I think it was Sir Frederick put to you a great many questions dealing with the tender made by Messrs. Lobnitz?

A.—Yes.

Q.—As far as I gather there were no questions put to you by him in connection with tenders of any of the other firms?

A.—Yes, there were. He asked why Fleming and Ferguson had not received full particulars.

Chairman.—Fleming and Ferguson asked for five rather simple answers to simple questions. For some reason which is not very apparent, Mr. C. S. Meik said he would have to send a letter to India. I can give you the document.

Sir H. Courthope-Munroe.—One can quite understand Sir Frederick's preference for the eminent firm of Lobnitz. In most of Pearsons' contracts, if there is any dredging work to be done, Lobnitz do it. Will you just tell the Committee why it was that you, in your honest judgment, gave preference to Messrs. Simons? What were the figures?

A.—Mr Meik took in the tenders and the result of his comparison showed that Lobnitz's tender was £840,000 and Simon's tender was £496,650, including the 10 per cent. for the extension of time.

Q.—Let me see if I have got it right. £496,650 as against £840,000?

A.—Yes.

Chairman.—And two dredgers as against one?

A.—Yes. I say that on the facts before him at that time we were surely justified in considering Simon's tender the most satisfactory? I am putting it on the facts before us at that time. Supposing we had recommended the very much higher price of Lobnitz, unless there were overwhelming reasons, which we do not admit there were at that time, what would have been said?

Sir H. Courthorpe-Munroe.—There is something like 75 per cent. difference between the tenders.

Sir Frederick Hopkinson.—Surely you have your figures wrong.

Chairman.—We have the whole documents. As it has been presented to us it conveys a wholly inaccurate impression. The figures are not right even.

Sir H. Courthope-Munroe.—Can you answer that question at once, Sir George?

A.—No, I cannot.

Q.—I am asking you to give the particular reasons which led you to prefer the tender to Messrs. Simons to the tender of Lobnitz?

A.—That is the reason I give—that according to the figures prepared by Mr. Meik, whom we cannot re-call, Lobnitz's tender was £840,000 and Simons' tender was £496,000.

Sir H. Courthope-Munroe.—No doubt you will be asked by Sir Frederick Hopkinson——

Chairman.—Let me help you, Sir Harry. The fact was that Sir George Buchanan was in India at the time. These three firms were asked to tender. One said, " I have no small berth vacant " and he dropped out. Fleming and Ferguson asked five questions which were probably not difficult to answer, but Mr. Meik did not answer them, and he said he would send the letter to India to Sir George Buchanan. Sending the letter to India was not of great help because the matter was urgent. However, that is how Fleming and Ferguson dropped out. Lobnitz were left. Lobnitz send on 22nd January a very full, long tender, and, as Sir Frederick Hopkinson worked it out, he showed you that on the price per ton Lobnitz' was a better one than Simons'.

Sir Frederick Hopkinson.—Horse power.

Chairman.—He also pointed out that there was double stage pump and 14,000 feet of pipe line.

Sir Frederick Hopkinson.—19,000 feet of pipe line.

Chairman.—The letter of Meik and Buchanan asked for 14,000 feet. Apparently Lobnitz specified for 19,000. None of those facts were ever conveyed to Sir George Buchanan. All the information he got was a very short concise telegram from Mr. Meik not giving particulars which would have enabled him to form a sound judgment. It is not his fault, but that is the fact. Nothing can get over those facts.

Sir H. Courthope-Munroe.—I am much obliged to you. (*To the Witness*): Could you at this juncture put before the Committee, if they have not got it, the actual letter that started the ball between you and Simons. It is the 25th July?

A.—They have got it.

Sir H. Courthope-Munroe.—You wrote that letter, and then in answer to that they sent you a tender?

Chairman.—Let us get it right. Letter of 25th July. A day or two prevous to that, an interview with Mr. McMurray. Letter 25th; visit to Renfrew, August 29th; letter September 12th. Those are the material dates.

Sir H. Courthope-Munroe.—With that letter I see you sent them a plan asking for the dredger plant required, which was to carry out the work on the plan. The Committee have got it and therefore I pass from it. Let us get on to the next matter. I see Sir Frederick Hopkinson asks questions of Sir Lawless Hepper again about the commencing of the wall from both ends, but you have dealt with that?

A.—Yes, that has been dealt with fully.

Q.—On page 19 I see that Sir Frederick Hopkinson is again trying to get light on the question of responsibility. He says to Sir Lawless Hepper, " What is the actual

chain of responsibility? When Sir George Buchanan was in charge he was supposed to be chief engineer directing all the operation?—(A.) Yes." You have dealt with that. It is on page 19 of your extracts, and it is in the examination of Sir Lawless Hepper. His answer is " Yes "—that you were in charge directing all the operations. You altogether deny that?

A.—I deny that absolutely.

Q.—It is quite inconsistent with the evidence given by Lord Lloyd, which the Committee had before them at a subsequent date. There is another matter which somewhat hurt your feelings. Sir Frederick Hopkinson, putting these questions to Sir Lawless Hepper, though possibly not with the view of the agreement which we now have before us, put this : " If you look at the agreement, it was definitely settled there. It was laid down that such works shall be commenced forthwith, and all such drawings, specifications, schedules and estimates, and any fresh or amended drawings, specifications, schedules of quantities and rates or estimates as may from time to time be required during the progress of the work shall be promptly prepared and forwarded to the Government of Bombay, and shall become the property of the Secretary of State." I am reading from page 20. So far as Sir Frederick read the document I make no complaint, but what I am venturing respectfully to complain of is his summing-up of the position, because he says there: " So it is all laid down definitely. Actually you were doing Buchanan's work out here." I think that is a thing you absolutely deny, Sir George?

A.—I absolutely deny it.

Chairman.—One moment. Was that with regard to storm water drains?

Sir H. Courthope-Munroe.—I think it was with reference to the general position.

Witness.—It was with reference to the general position.

Sir Frederick Hopkinson.—No.

Sir H. Courthope-Munroe.—If you say no I accept it, of course, but the general paragraph is read, and then Sir Frederick sums it up (it might be justified in one view of the agreement, but when you sit down and read the agreement I suggest it is quite a misapprehension) : " So it is all laid down definitely. Actually you "—that is, Sir Lawless Hepper—" were doing Buchanan's work out here?—(A.) Yes."

Sir Frederick Hopkinson.—The evidence given was that they were designing the storm water drains.

Chairman.—And, if you remember, on the 4th January, 1923, there was an interview with Sir Chimanlal Setalvad, and he commenced by saying : " Why have we got a staff of draughtsmen here. What does all this mean." That is how he commenced the interview.

Sir H. Courthope-Munroe.—You have had the advantage of seeing the witnesses at the earlier stages of the proceedings.

Chairman.—That is in Sir George Buchanan's statement. He sets out an interview of the 4th January, 1923, and he himself says that it commenced by Sir Chimanlal Setalvad saying : " Why have we got a staff of draughtsmen here? Is not that your work? " That resulted in the agreement, if you remember, by which it was arranged that as regards permanent works Sir George should design them.

Witness.—That was right, yes.

Sir H. Courthope-Munroe.—As long as it is understood that we repudiate altogether the suggestion that Sir Lawless Hepper ever did any work on behalf of Buchanan, it is all right. It is quite possible there might have been a mistake. It is a little difficult to find out exactly what Sir Lawless Hepper's work was.

Chairman.—I wish you would tell us.

Sir Frederick Hopkinson.—Is not that why I pressed it so hardly?

Sir H. Courthope-Munroe.—I am not complaining. I started by saying that one must remember in reading this book through, that it was a different agreement pronounced upon by the Chairman—Sir M. Visvesvaraya taking one view and you taking another view. No doubt your questions were put in support of your own view.

Sir Frederick Hopkinson.—My questions were put in order to find out the facts.

Chairman.—If you will tell us from the evidence what Sir Lawless Hepper professed to be doing, we shall be very grateful to you.

Sir H. Courthope-Munroe.—That is my puzzle.

Chairman.—I do not pretend to know at present.

Sir H. Courthope-Munroe.—That is my difficulty. Here was a gentleman whom Lord Lloyd said was to be a watch dog, and was in charge of everything to see the

smooth and efficient working of the scheme, and whenever he is cornered by Sir Frederick Hopkinson or by you or by any member of the Committee he says (as I have pointed out four times) that he is not responsible for technical details. The big thing, as far as I can see, was the dredging, and obviously there is nothing less technical than dredging. I cannot discover from this what his particular job was.

Sir Frederick Hopkinson.—You will probably agree that I really tried to find out the position.

Sir H. Courthope-Munroe.—You did, Sir.

Chairman.—We all did.

Sir H. Courthope-Munroe.—And your only success at this stage appears to have been that it seemed to emerge indirectly that he was doing his own work and Sir George's. That is all I want to point out. At the bottom of page 20, Sir George, there is one matter I want to mention in order to pass it. It is suggested that you took what Mr. Kidd had done blindly. I think you have gone into that?

A.—Certainly, I took his soundings.

Q.—Shall we pass on to page 22—management. There again Sir Frederick was trying to find out the chain of responsibility, and he puts some very pertinent questions here. He says, " Do you think that it had a management of that character?—(A.) I think it had the management it deserved. I do not know how far I am personally concerned in this." I should have thought pages 19 and 37 of the scheme would have been enough for that—what is stated there, apart from Lord Lloyd's evidence. Then he says, " I put you aside. Meik and Buchanan were doing the work." That is based on the other view of the agreement. Then Sir Frederick puts this very pertinent question: " Had they decided to do it departmentally, do not you think the proper procedure would have been to search the world and offer £20,000 or £30,000 a year to manage the thing? " He says he cannot imagine the Government doing that.

A.—Sir Lawless Hepper was undoubtedly the manager.

Q.—In dealing with the management he says: " I do not know how far I am personally concerned in this." He has obviously stripped the board entirely of anything that can be, by any stretch of the imagination, called " technical," and our difficulty is to find out what is left. Then on page 24 there is this question about the suggested antipathy between you and Mr. Lewis, but I will pass that by because we have dealt with it at some length. On page 25 there are some questions put to Sir Lawless Hepper about the laying out of the site as distinguished from filling in?

A.—I have already discussed that.

Q.—Then at page 28 the question is put by Sir M. Visvesvaraya about the pumping: " Of course, had Sir George Buchanan's ideas been satisfactory there would have been no other dredger required but the " Lloyd " and the " Colaba "? There is no provision in his scheme for pumping from Back Bay?—(A.) No, there was not." The pumping from Back Bay was initiated by Mr. Lewis, was it not?

A.—By Mr. Lewis, in conjunction with Sir Lawless Hepper.

Q.—It had nothing to do with you?

A.—Not the initiation, no.

Q.—Then I see that at the bottom of the same page questions are put by Sir Frederick Hopkinson to Sir Lawless Hepper about the staff. He says: " I am going to ask you a rather delicate question. Are all your staff connected with the dredging in a happy or in an unhappy state of mind "? He says: " I thiuk myself they are in a happy state of mind. I have heard nothing to the contrary." How does that fit in with your recollection when you were there?

A.—Certainly it is not in accordance with my recollection. I do not think I ever went to Bombay without receiving memorials from the crews of the dredgers making numbers of complaints. It was no business of mine to receive memorials, and I naturally handed them back to the superintendent of dredging for him to see the Director about it.

Q.—I think one of the witnesses pointed out that in one case the crew had to be got rid of and a fresh crew got?

A.—They were not happy, and when men are unhappy and there is no team work, naturally the work suffers.

Chairman.—Was it not your duty to advise the Bombay Government that that state of things was going on?

A.—I do not conceive that to be my duty. The Director was the manager.

Q.—But if you believed that there was such disaffection amongst the crew so that they were not really turning out their work, as the adviser of the Bombay Government, ought you not to have looked into the matter? You had to assist and advise and supervise. Those are the three words?

A.—But I had not to interview dredging individuals who had grievances.

Q.—No, but if you came to the conclusion that the work was suffering because there was discontent amongst the crews, ought not you to have taken it up with Sir Lawless Hepper?

A.—Well, I probably did discuss it with Sir Lawless Hepper. I certainly have not put anything in writing about it.

Q.—And further, if you got no satisfaction from Sir Lawless Hepper, ought you not to have gone up to the Governor or to Sir Cowasji Jehangir?

A.—There we are coming back to the old question.

Q.—I know, but you and I know how perfectly easy it would have been to have got an interview with Sir Leslie Wilson or Sir Cowasji Jehangir. You and I know how ready both of them would have been to have helped you in every passible way?

A.—I cannot subscribe to that view, Mr. Chairman. What happened, for instance, in connection with Mr. Lewis? What happened after I had spoken to the Governor of Bombay and written to the Governor of Bombay and spoken to the Honourable Member? What happened after all this correspondence. With all the papers before him, all the Honourable Member did was to say: "Well, Mr. Lewis must in future direct all his correspondence through the Director of Development."

Q.—Have you any letter which you sent to the Governor and to Sir Cowasji Jehangir?

A.—I can put in the correspondence.

Q.—The letter I want, if there is one, is a letter in which you spoke about the necessity of Mr. Lewis leaving. That is the matter you are referring to, is it not?

A.—That is the matter I am referring to.

Q.—If you have a letter of that kind will you let Mr. Ewbank have it, because we would like to see the terms of it?

A.—I will put in all the letters.

Sir H. Courthope-Munroe.—Do you want the letter to which I referred? There are four or five.

Chairman.—It seems to me we shall want them. I have made a note of one or two documents which we were promised.

Sir H. Courthope-Munroe.—I want you to have them. I referred to four or five. If those are the ones you want I will see that they are put in.

Witness.—Is the one you refer to the letter of the 3rd June, 1922? It is the one I refer to in my note, I think. After going at some length into the matter it finishes up by saying that there can be little doubt that Lewis's health has broken down seriously and "in the opinion of Mr. Meik and myself you would do well to have him examined at home by a Medical Board for an expression of opinion as to his fitness to continue hard work in the East."

Chairman.—Was that to the Governor?

A.—That was addressed to Sir Lawless Hepper. The letter to the Governor was put in.

Sir H. Courthope-Munroe.—Let us get it right. What is the date of that letter?

A.—3rd June, 1922.

Sir H. Courthope-Munroe.—I also read one of the 8th June. Have you got that, Sir?

Witness.—The letter to the Governor was on the 31st July, 1922.

Sir H. Courthope-Munroe.—I referred to that.

Secretary.—They have not reached me yet.

Witness.—I read it out.

Chairman.—Then it is on the shorthand notes?

A.—It should be.

Sir H. Courthope-Munroe.—If you have not got it you ought to have it. I seem to have a little bundle of correspondence here. I will hand them in. (To the witness) This is the letter of the 31st addressed by you to Sir George Lloyd?

A.—That is the one.

Q. What did you say in that letter?

A.—I read the letter out at a previous meeting of the Committee. It is to the effect that there seemed to be some misapprehension as to our position and that we were very much concerned about the absolute cessation of all letters and reports from Mr. Lewis and so on.

Chairman.—This is one where you start by saying "At our last meeting in Bombay I told Your Excellency that there seemed to be some misapprehension as to our position. Mr Lewis appeared to be regarded as the chief engineer in fact as well as in name, and at the meeting of the Advisory Committee I was not even introduced to the members"?

A.—Yes, that is the letter. Then there were enclosures which I promised the Chairman I would put in, and I am putting them in.

Sir H. Courthope-Munroe.—You conclude by saying " I have written this letter because I know how very interested Your Excellency is in everything connected with the Back Bay scheme and believe you would like to hear of any difficulties direct from me." You have got the letter of the 3rd June, have you not, Sir?

A.—I am afraid not.

Sir H. Courthope-Munroe.—If you have not I can give it to you.

Witness.—We have got notes of these letters.

Sir H. Courthope-Munroe.—It may be more convenient if I hand this bundle in.

Witness.—I have a bundle here. I can hand in the whole lot.

Chairman.—If the 3rd June letter begins " We desire to address you on the subject of the relationship," it is what I call the veil letter—" The veil appears to have dropped." I know that one.

Sir H Courthope-Munroe.—I am told there are two letters of the same date.

Chairman.—Sir George understands that it is the " veil " letter.

Witness.—Yes.

Sir H. Courthope-Munroe.—I think you have got all the letters you want now on that, have you not, Sir? Have you got the final letter of the 30th August, 1923?

Chairman.—No.

Sir H. Courthope-Munroe.—You ought to have that. That completes the chain of the four letters I have referred to. While my solicitor is finding it I will go on. (*To the witness*) I see, Sir George, that at the bottom of page 29 Sir Frederick Hopkinson puts this question to Sir Lawless Hepper, to which he readily assents : " I gather from this volume of correspondence and notes regarding the determination of the agreement with Messrs. Meik and Buchanan that Sir George Buchanan had really very little to do with the construction of the reclamation. Evidently they got out the original designs and thereafter practically did nothing?—(A.) That has always been my view." What do you say to that?

A.—I say that I think it has been stated here over and over again that the actual carrying out of the work was done by Sir Lawless Hepper as Director of Development, with Mr. Lewis as chief engineer.

Q.—It was not your job?

A.—It was not my job.

Sir H. Courthope-Munroe.—So it is true to say you did nothing. You got out the designs and thereafter did nothing. The carrying out of the work was their job and not yours.

Sir M. Visvesvaraya.—I asked for a list of plans and important reports or memoranda on technical matters prepared by Sir George after his preliminary report of 1919 was submitted. I have not had any definite reply. I do not know whether Sir George can enlighten us.

Witness.—We will supply anything we have.

Q.—I mean the list?

A.—We will give you the list.

Sir M. Visvesvaraya.—I want to know the definite work your client did for the scheme after that preliminary report was submitted. One of the criticisms is that after that preliminary report there was no important plan or estimate prepared by Sir George Buchanan.

Chairman.—All you want, as I understand it, is an index with the date and such and such a plan and another date and such and such a plan?

Sir M. Visvesvaraya.—Yes.

Sir H. Courthope-Munroe.—(*To the Witness.*) Do you understand that?

A.—Yes, I quite understand it.

Q.—Will you try to give it to Sir M. Visvesvaraya?

A.—Yes. It will take a few days, because I am afraid there are a great deal more than half a dozen or a dozen or two dozen, but it will be done.

Sir M. Visvesvaraya.—Only the important ones. I do not want many details.

Sir H. Courthope-Munroe.—Passing on, at page 30 there is a reference to the preparation of the estimates for the roads and for the storm water drains. You have explained the difference between the two estimates?

A.—I have explained that fully.

Q.—You always estimated for the storm water drains, but you did not estimate, except in the second case, for sewers?

Sir H. Courthope-Munroe.—There has been a little trouble there as to the meaning of the word " drains."

Chairman.—Again, Sir Harry, the matter is not quite so simple as that. Mr. Kidd got estimates from the Public Works Department showing that roads, lights and drains could be done for 59 lakhs. It is a most curious thing, but we have those estimates, and we cannot find that figure of 59 lakhs. We find the figure of 95. Whether that was a transposition in Mr. Kidd's report of 1912 we shall not know, but it is a very curious thing. The documents are here. The only figure we can find is 95. In Mr. Kidd's report it appears as 59. Sir George Buchanan neved saw those P.W.D. reports, but he put on an arbitrary amount of some 16 lakhs, and made it 75 in his report of 1919. He assumed that in the P.W.D. estimate were included storm water drains, I suppose?

Witness.—I did, certainly.

Sir H. Courthope-Munroe.—But you never intended to estimate for sewers, and you did not?

A.—Never.

Q.—But you intended the word " drains," where you use the simple word " drains," to include what we understand by drains plus storm water drains, but not sewers?

A.—I never intended it to include sewers.

Sir H. Courthope-Munroe.—If the figure you mentioned, Mr. Chairman, of 95 is a transposition of 59, then if Sir George, in making his estimate, merely added a percentage as an arbitrary figure, it ought to be added to the 95 and not to the 59.

Chairman.—That is the explanation that suggests itself. There is no figure of 59 lakhs in these original P.W.D. estimates which we have, but there is a figure of 95. Therefore one might possibly think that there had been a transposition of 5 and 9; but Sir George Buchanan never himself went into that estimate, nor did he ask for any revised estimate from the P.W.D. He took 59 as it was printed in Mr. Kidd's report.

Sir H. Courthope-Munroe.—Taking 59 and 95, there is over 50 per cent. increase straight away.

Chairman.—The increase was from 59 to 75, and subsequently the 75 was increased to 135, and there was added in pencil on that original document the words " storm water."

Witness.—And sewerage.

Sir H. Courthope-Munroe.—In any case, Sir George, this was a mere arbitrary figure, because your case is that until the scheme was developed and the site laid down any exact amount for drains could not possibly be got at?

A.—That is my view.

Q.—You want to know the length of the streets and the number of the streets, and various other things, before you can get an exact estimate. The next thing is at page 32. Again, continuing his search, Sir Frederick asks Sir Lawless Hepper, " if anything went wrong it was Mr. Lewis who would be responsible and not you, or the Government of Bombay? " Sir Lawless Hepper says: " No, I take it it would be Meik & Buchanan ". He will not take it himself; he will not take even the Government—it is you. Again you reply: " Scheme and agreement ".

A.—Yes.

Sir H. Courthope-Munroe.—Then I see Sir Frederick Hopkinson follows that up by saying, " And so it is Sir George Buchanan who comes in for the blame, and not the Government. I am asking you who is responsible?—(A.) I think the engineers." Here is one matter which is a little important to you, on page 33. I think, Sir M. Visvesvaraya was under a misapprehension as to the standing of your firm. He says the firm is only of a few years' standing.

Sir M. Visvesvaraya.—I understood that he had joined it recently.

Sir H. Courthope-Munroe.—In point of fact, your firm has been in existence for over half-a-century?

A.—Yes.

Mr. Billimoria.—Not as Messrs. Meik & Buchanan?

Chairman.—Sir M. Visvesvaraya no doubt had in his mind the fact that there had been a recent partnership of Meik & Buchanan.

Sir M. Visvesvaraya.—" Meik & Buchanan " was recent.

Chairman.—If you look at the original transcript you will see that Sir Frederick Hopkinson jumped in at once and said that the firm was of very old standing.

Sir H. Courthope-Munroe.—I am not complaining; I only wanted to clear it up. Following that the financial question was gone into. I think you have said, time and again, that finance was entirely outside your province, and that you never advised the Government on the financial question?

A.—That is correct.

Chairman.—Well, Sir George, finance was not entirely outside your province, at all events when you were dealing with Sir George Lloyd at the outset, because, if you remember in his letter he wrote to you and said that the two things he wanted you to advise him about were the feasibility of the scheme and whether, on present prices of dredgers, it would be a reasonable proposition?

A.—Yes, but I prepared my estimate. I had nothing to do with the advising as to the financial proposition. I never made any calculation whatever as to the profits.

Chairman—As long as that is made clear.

Sir H. Courthope-Munroe.—There is one other matter which I think you want to put before the Committee in some different way to that in which it has been presented hitherto, and that is this. It was put to you by Sir Frederick Hopkinson—I forget the exact language, but in effect it was that the scheme was a failure before it commenced. Sir Frederick Hopkinson will recollect the reference. Then Sir Frederick drew certain lines on the map and pointed out (correct me if I go wrong) that with the provision of 10,000 feet of piping, and with the provision of the dredger and the booster, there were certain parts of the land which had to be reclaimed which could not be reached. I think I have put it more or less accurately?

A.—That is right, yes.

Q.—That, as a proposition is true. I mean that there were certain portions of the reclamation scheme that could not be reached by the 10,000 feet, plus the dredger, plus the booster?

A.—Quite.

Q.—I want to get this: the actual area which you had to fill was 25,000,000 cubic yards?

A.—Yes. That is right.

Q.—There was a certain small portion on what is called the Marine Lines? There are two ends—the Colaba end and the Marine Lines end?

A.—As a matter of fact, I told the Chairman I would put in a statement about that.

Q.—Just follow me. I want to get it clearly. You have got to deal with a whole area of 25,000,000 cubic yards, is that right?

A.—That is right.

Q.—There was a portion of what I have called the Marine Lines which comes to 150,000 cubic yards?

A.—No, more than that.

Q.—How much is it?

A.—About 1,000,000 cubic yards.

Q.—That is a different figure from the one you gave me, but give it in your own way. What I want to get at is this. There are two points—the Colaba end and the Marine Lines end, where admittedly you cannot reach with the existing 10,000 feet and the dredger and the booster, but do they total up to a very small percentage of the whole?

A.—No, I do not say that at all.

Q.—What is the percentage?

A.—I cannot tell you at the moment.

Chairman.—You have given us a statement, have you not, Sir George?

A.—Yes. I do not know whether the statement is in yet, but I promised you a statement.

Sir H. Courthope-Munroe.—Then I will leave it.

Chairman.—You have certainly given us a statement with regard to it. I do not know if you propose to put in a supplemental one, but you have dealt with it in a statement you have given us?

A.—I should like to see that. I do not know which statement I have put in.

Sir H. Courthope-Munroe.—If you have put it in I do not want to take it in detail.

Chairman.—Leave it like that. Will you add anything you would like to about the matter, because if it is suggested that there was a very small area that could not be reached by the 10,000 feet we ought to have it scaled off and seen?

A.—Yes, I am perfectly prepared to do that.

Sir H. Courthope-Munroe.—Leave it for your statement, but take it on broad lines. Admittedly there was a portion of this area that could not be reached by the plant that you specified for. As a practical proposition, would any engineer specify for a plant,

especially when the plant is running into something like a quarter of a million for the dredger, which would definitely do a particular range all the way round? Would you not sort of strike an average?

A.—All I can say is that we did the best under the circumstances, and I prefer to leave it in that way and put in the statement.

Sir H. Courthope-Munroe.—If, when your machine has done its utmost with its 10,000 feet, there does remain here and there small portions——

Chairman.—33 per cent. and 25 per cent.

Sir H. Courthope-Munroe.—That is not my percentage? Is that your percentage?

A.—I should say that was about the percentage.

Q.—One-third. What is your answer to that? You spoke of having a second booster?

A.—I have put it all in the statement.

Q.—If it is there I will leave it.

A.—I will leave it at the statement.

Q.—On page 38 some questions were put by Sir Frederick Hopkinson to Mr. Brims. Sir Frederick asks: "Did he ask you to work 24 hours a day?" and Mr. Brims says: "Yes; before I came out here I said it was my intention to work 24 hours, if possible.

A.—That has been admitted. That is in the evidence. I do not think we need go into that.

Q.—Turning over to page 39, Sir Frederick asks him about the possibility of working 24 hours, and then he says: "During last year we were working nearly 18 hours a day, and we did 1,821 cubic yards per pumping hour for one week." I think upon that you say if he could do it for one week, why not for two weeks or more?

A.—Yes. He said in his evidence he had done 2,000 cubic yards. I say if he had done it for a week he ought to have done it for two months.

Chairman.—If the material of the same depth and same consistency of face was there.

Sir H. Courthope-Munroe.—Yes; but it is the fact that there was heaps of material, though not in any particular spot. Sir George accuses them of getting on to one spot and sticking there. That is the point you have been endeavouring to make?

A.—We have gone into that in great detail.

Sir H. Courthope-Munroe.—The letters show that.

Sir Frederick Hopkinson.—He would have to satisfy us that he ever did that quantity in that given time.

Sir H. Courthope-Munroe.—Mr. Brims would?

Sir Frederick Hopkinson.—Yes.

Sir H. Courthope-Munroe.—Sir George wanted to comment upon that. If the man says that with this much-maligned dredger, in point of fact they did over 1,800 cubic yards per hour in one week, on the face of it, why should not that go on?

A.—That came out in my evidence.

Sir H. Courthope-Munroe.—If the stuff was not there, obviously it could not go on.

Chairman.—You must not assume that we accept everything that Mr. Brims said.

Sir H. Courthope-Munroe.—I do not know what impression Mr. Brims made, as I did not see him. I do not know what impression he made on you.

Chairman.—Not a very good one, I am afraid.

Sir H. Courthope-Munroe.—Is there anything else in Mr. Brims' evidence you want to refer to?

A.—No; except Mr. Brims did not give nearly the whole of the experience he had in dredging.

Chairman.—That is unfortunate, because as he left it he seemed to be a man of practically no experience at all. You have seen that in his evidence?

A.—Well, we would like to put in a statement of Mr. Brims' experience showing he had enormous experience in dredging.

Q.—I think we should like to see that.

A.—We would like to put in his application for the appointment, in which he showed that he had very great experience in dredging.

Q.—Your firm so stated in letters to India—that he was a dredging master of great experience?

A.—Yes.

Chairman.—I have been rather puzzled about that because when he was asked his own experience he told us very little, and that experience began when he was a boy of 22, and seemed to have ceased very suddenly.

A.—We would like to put in his application.

Sir H. Courthope-Munroe.—Can you put your hand on it now?

A.—Not now.

Chairman.—Mr. Ewbank will make a note of that. We ought to see it.

A.—If Mr. Ewbank makes a note of any papers we shall be delighted to produce them.

Sir H. Courthope-Munroe.—I see on page 43 you have marked a question put by Sir M. Visvesvaraya: "When the scheme was embarked upon were you at all consulted by the Development Department or by the Government?" That was put to Mr. Neilson, and his answer was No. Do you wish to say anything about that? You have marked it in my copy as being important.

A.—No; I have nothing at all to say about that. In fact, vary many things have been dealt with in the evidence since we prepared this document.

Q.—That is why I am skipping page after page.

A.—I do not think there is very much more to say.

Chairman.—Really, at this moment, there is very little you can tell us. If there is anything Sir George can tell us now we are most anxious to have it.

Sir H. Courthope-Munroe.—I am doing it in this disjointed way to avoid taking up time. Will you look at page 45, where there is a question about this Wilson shovel? Is that anything to do with you?

A.—Nothing at all. That is all on the record, if I may say so. We have discussed that.

Q.—You want to draw the Committee's attention to the fact that the Wilson shovels were bought against your specific advice?

A.—Yes.

Chairman.—I have made that point; but is it Wilson or Whittaker shovels? Is not it Whittaker shovels?

Sir H. Courthope-Munroe.—They are called Wilson here.

Chairman.—They are called Wilson and Ruston, but I believe they are Whittaker.

Sir H. Courthope-Munroe.—Still, having got them, you do not see why they should not have made some use of them?

A.—No; I do not think they could make any use of them.

Chairman.—As shovels?

A.—As shovels.

Sir Frederick Hopkinson.—I believe they are Whittakers, from my recollection of their appearance; but the plant list does not show which they are.

A.—We can find out.

Chairman.—It is only to get it right?

A.—Yes. Then the next thing is at the bottom of page 46.

Sir H. Courthope-Munroe.—You draw attention to a question put by Sir Frederick to Mr. O'Rorke: "Do you think any contractor would have given a price for doing the work upon the materials available in 1919?" What do you want to say about that?

A.—No one suggested that a contractor should go and give a price upon the report of 1919.

Q.—On page 48 I think you ought to say a word about the costing account.

A.—Well, I think we all know about the costing account.

Q.—You have letters here in which you were complaining about the absence of costing accounts?

A.—Yes.

Sir Frederick Hopkinson.—Any language Sir George could use in connection with that matter would not be half as strong as the language I should use.

Sir H. Courthope-Munroe.—I say no more, and I pass from it.

Sir M. Visvesvaraya.—I wish to endorse that statement also.

A.—There is our letter on the subject.

Sir H. Courthope-Munroe.—Do you remember the date of it?

A.—No. We can put it in. In one of my reports I wrote and pointed out there were no costing accounts. My firm then rubbed it in by writing another letter to Sir Lawless Hepper emphasising the fact that there were no costing accounts.

Sir Frederick Hopkinson.—I think we have got those letters.

Sir H. Courthope-Munroe.—That is a letter of the 13th April, 1922, in which you say : " While concurring generally with the report, we particularly desire to notice and emphasise the paragraph concerning the engineering staff and engineering accounts. It is impossible to carry out efficiently large public works without adequate engineering staff, and it is equally impossible to exercise economy without a proper system of costing accounts." Is that the letter you mean?

A.—Yes.

Chairman.—We have not that actual letter of the 13th April, 1922.

Sir H. Courthope-Munroe.—It is an important letter sent by the firm to the Director of Development. Then in the concluding paragraph he says : " We received by the mail which arrived here on the 3rd April the chief engineer's letter dated the 17th March, enclosing an indent for additional plant and machinery. Tenders are being taken in for the whole of the indent, and we have in our letter to the chief enginner dated the 11th April, 1922, questioned the necessity for some of the plant, and have asked him to take our orders." That is what you want to lay stress on?

Chairman.—We have brought all that out, but we ought to have that letter.

Sir H. Courthope-Munroe.—I will have a copy of it made and let you have it. Then on page 15 you have marked something about moorum. Do you want to add anything to that?

A.—No ; so many things have been dealt with since we prepared this on the Bombay evidence, and it is all on the note.

Q.—If you say no I will pass on at once. Turning to page 51, I think there is a point which has not been put. Sir Frederick Hopkinson asked Mr. Elgee : " Do you not have any specification giving particulars of the constituent parts of the concrete? " and the answer was No. What do you say about that?

A.—We have already said that there are specifications. If they were not used it was the chief engineer's fault.

Q.—This answer, to put it no stronger, is absolutely incorrect?

A.—Absolutely incorrect.

Sir Frederick Hopkinson.—My question was to Mr. Elgee, who was in charge of the construction of the sea wall.

Sir H. Courthope-Munroe.—I am not complaining of your asking the question, but the answer given is incorrect. I do not want to use the word " untrue," but it is absolutely wrong. There are specifications, and they were pigeonholed somewhere in Bombay.

Sir Frederick Hopkinson.—What Mr. Elgee said was that he had not had it.

Sir H. Courthope-Munroe.—You asked him : " Do you not have—— "

Sir Frederick Hopkinson.—" Did you not have—— "

Sir H. Courthope-Munroe.—" Do you not have any specifications giving particulars of the constituent parts of the concrete? " and he says " No." He does not say he has not individually got them.

Sir Frederick Hopkinson.—That was a staggering answer to me.

Sir H. Courthope-Munroe.—I should think so, but the answer to it is that they were supplied.

A.—They were supplied with the specifications to the resident engineer——

Sir H. Courthope-Munroe.—Whether they got into the waste-paper basket or a pigeonhole you do not know.

Chairman.—When you are giving an index of the plans and specifications you might star the one which contained the specification for concrete, so that we shall know.

A.—I will.

Q.—Just put a little note in the margin : " This is in relation to the concrete."

A.—Yes. Then go on to the bottom of page 54.

Sir H. Courthope-Munroe.—What do you want to say about that?

A.—That is estimates.

Q.—Do you want to say anything in passing about this caterpillar business?

A.—No.

Sir H. Courthope-Munroe.—There has been a misunderstanding about that. Sir Frederick let himself go at the Witness on that, but it is probably a misunderstanding as to what actually took place.

Chairman.—We will pursue it if you like, because I have taken great pains to find out how a caterpillar tractor functions, and I can explain it to you ; but I think it would be better to pass it by.

Sir H. Courthope-Munroe.—Obviously. I am not in the least desirous of going into that. It is simply a misunderstanding about it. Going to the other point about Mr. Kidd, that is at the bottom of page 54?

A.—Yes.

Q.—What do you say about that?

A.—I would like to say a word about the caterpillar. The way it arose was that the Chief Engineer wanted to spend more money. He came to me with proposals for buying this caterpillar.

Chairman.—It was the Bucyrus?

Q.—What happened was they got the Bucyrus, and they wrote that there is some difficulty about this, because the tractor, the Bucyrus, we have got is not the same as the track and they suggested for something like 11,000 rupees it could be converted into a caterpillar tractor; and then they discussed caterpillar tractors; that is how it arose.

A.—The Chief Engineer asked me to get it at home. It was more expenditure on plant. I did not want to get it. I went up to the man at the quarries, O'Rorke, and asked him what use he could make of it That is the whole thing in a nutshell. Then I come on, at the bottom of page 54, to the details of estimates.

Sir H. Courthope-Munroe.—What do you want to say about that? This is the old question as to whether your report was in more detail than Mr. Kidd's?

Q.—Just put that in a few words, if we have not exhausted it?

A.—I will.

Sir Frederick Hopkinson.—We have got both, and we can compare them?

A.—No, I disagree. I would like to say something about the preparation of my 1919 report and about the comparison with Mr. Kidd's. I would like to talk five minutes about my 1919 report, as I think it would be useful.

Chairman.—Please do.

A.—Some Engineers are frequently asked to report upon others' schemes; and in this case I was asked to report upon Mr. Kidd's scheme. Very well. When I received Mr. Kidd's scheme, I found it was extraordinarily lacking in detail. There were no quantities, and there was nothing by which I could find out how many hundred cubic yards of concrete, or how many million tons of stone, and so on, were required. His report said " so many lineal feet of wall " ; but there were no particulars given about the dredging plant whatsoever. For a report which had been accepted by the Government of India as so full of detail that work would at once be proceeded with upon that report, I found it exceedingly deficient in detail. I had to take Mr. Kidd's report, and I had to take out the whole of the quantities from Mr. Kidd's drawings and from my own schedules; so that my report, which was not supposed to be a detailed report, was crammed full of details in comparison with Mr. Kidd's report. I would like to point out that Consulting Engineers, when they write reports of that nature, do not write detailed reports. The only fault I have to find with my 1919 report is, that it is extraordinarly full of detail. In fact, it has got a very great deal too much detail for a report of that nature. The scheme had not been sanctioned. It was in contemplation. An Engineer writing a report on a scheme which has not been sanctioned, as a rule puts as few details as possible. I thought it would interest the Committee if I gave you two examples. You have not had the advantage of taking any evidence from Consulting Engineers in Westminster, so that you have only to take my opinion of their practice. But here is a report which Mr. Meik wrote in 1897 to Sir Weetman Pearson, who was proposing to build a large harbour at Santa Cruz. He is reporting on another Engineer's report, but here is the report. I suppose it was satisfactory. There is no single detail of costs in the report. (*Document handed in.*)

Sir Frederick Hopkinson.—What is the date of that?

A.—1897. Here is another report. I would rather not mention names. This is a report from a very famous firm of Engineers on a very large public works, and as far as costing is concerned you will see there what details of costing are given. (*Second document handed in.*)

Mr. Billimoria.—Could these reports be said to be on all fours with the report you made? Surely the position and the circumstances at Bombay were different?

A.—The report is on all fours.

Q.—The Governor had been entirely dependent on your report, and he wanted an exhaustive report with advice from you?

A.—The report would have been just as exhaustive with so many figures. I should like to clear up several points in connection with this report. I have been examined repeatedly as to the time I spent in Bombay. I suggest that there is some confusion in the minds of the Committee as to what constitutes an Engineer's estimate and what constitutes a Departmental Contractor's estimate. I was not preparing a Contractor's estimate. It was not any part of my business at that stage, when the scheme was

under consideration, to go into questions in detail about where the stone is obtained, and analyse the cost of labour in detail. We never do. You can get evidence from all Westminster on that point. The scheme was not even sanctioned. Obviously after my report had been received, then if the work had been let by contract, the contractor would have done all that work before he put in a price. As it was done departmentally, the work which ordinarily would have been done by the contractor fell to the Development Directorate through their Chief Engineer and their Director. My report was an Engineer's report upon Mr. Kidd's scheme. I had his surveys and all his data, and the Government of India had approved of them up to the hilt. Then when I arrived in England, I took out, as I have already described, all the detailed quantities and material from Mr. Kidd's drawings, not from his report, because they were not in his report at all. I had to take them out from his drawings, in order to analyse his report. I affixed prices to the schedule in accordance with our experience of similar work, and the data I had obtained in Bombay. That is the universal way in which an Engineer prepares his estimates. We do not go into details. We consider the less detail as a general rule that we put in our preliminary reports the better. That is all. I merely wanted to describe the procedure in preparing these reports.

Chairman.—You have given us much the same evidence on the third day of your evidence at page 9, in which you gave us the figures, and told us exactly how you got your totals out.

A.—Yes. I wanted to emphasise it, because I feel very much the suggestion that I in any way whatsoever neglected the preparation of that report.

Sir M. Visvesvaraya.—May I ask you one or two questions in this connection? Mr. Kidd's report and estimate were not intended to be final. A detailed estimate was to follow.

A.—They were so final that the contract was going to be let upon them.

Q.—But it promised a detailed report later on at Bombay.

A.—No, I think not.

Sir Frederick Hopkinson.—There is a paragraph in which Mr. Kidd said he would want 5 per cent. after the estimate had been checked—after the final estimate had been made and checked.

A.—At all events the Government of Bombay said that the report was clear and complete. All the detailed points had been settled, and the revised estimate might be accepted as completely trustworthy and ample. My point is that the Government of Bombay could not possibly have criticised it as trustworthy and ample unless they did what I did, and took out all the quantities.

Sir M. Visvesvaraya.—Mr. Kidd did not give the details of the project to the Government of Bombay.

A.—It was purported to be detailed.

Q.—He withheld details from the Government of Bombay; he did not give them.

A.—No, he did not give details; but the Government accepted it.

Q.—How could they accept the estimate without the details as a final working estimate?

A.—The Government of Bombay, on the 7th August 1912, wrote to the Government of India and said: "With reference to Messrs. Lowther & Kidd's report, the drawings might be considered as complete working drawings. They would give sufficient information for the examination of the designs and the immediate commencement of the work. The investigation had been most carefully made, and might be accepted as exhaustive. The report was clear and complete. The revised estimate might be accepted as completely trustworthy and ample."

Sir M. Visvesvaraya.—But details were to follow. That was not to be the working estimate.

A.—I do not know. There is nothing in that letter to say that.

Sir M. Visvesvaraya.—The details were not given.

Mr. Billimoria.—Did they not conclude that letter by saying: "It will require further detailed investigation"?

A.—That came much later on, with another Government in Bombay; and I pointed out at the time to the Chairman that it was inconsistent. In fact, when you were examining me, we discussed the question of inconsistency.

Q.—That is what I recollect.

A.—I have nothing more to say on that point.

Sir M. Visvesvaraya.—Anyhow, the details were not given, and without the details no estimate could be considered as final and complete. Another point is this: You stated in your report that the estimates given by you were reasonable and reliable.

A.—Yes; and I still say they were reasonable and reliable.

Q.—Reasonable and reliable?

A.—Yes.

Q.—But the details were not there?

A.—The details were there. The details were all in my report which were not in Mr. Kidd's report, which should have been in Mr. Kidd's report. I furnished the whole of the quantities.

Q.—But as soon as your report was furnished and the work was begun, did you also give to your Resident Engineer or Chief Engineer independent orders to proceed with detailed estimates and plans?

A.—We at once proceeded with what we had intended to do—working out the contract drawings, the rates, and so on, with the Colaba contract, and the Director of Development and his Engineer went on with detailed estimates on the basis of Contractors' estimates for the Kandivli quarry.

Q.—I want to know whether it required such a long time as nearly two years to prepare a detailed estimate for a project where there was one sea-wall and some amount of filling?

A.—Sir Frederick Hopkinson asked me that question, and he said that a contractor would do it in a few months. I said: Yes, a contractor would do it in a few months, or a few weeks; but the way the things were done in Bombay, under the rules of the Government of Bombay, it would probably take two years.

Sir Frederick Hopkinson.—The real point of the matter is this: As you know, prices were jumping about in 1920 and 1921?

A.—Yes.

Q.—An estimate made in January 1920 might be absolutely useless by the end of the same year?

A.—Yes.

Sir M. Visvesvaraya.—But you must have estimates.

Sir Frederick Hopkinson.—I know; but if you take two years to get out the estimate, by the time you finish it the prices would be entirely different, and you have got to begin all over again.

A.—I am very glad to hear you say that and confirm what I have said on that point.

Sir H. Courthope-Munroe.—At this period of time, everything was absolutely abnormal. There has hardly been a period like it in the history of the world, I should think, so far as prices were concerned.

A.—That is all I want to say on the estimate.

Q.—Then going on, on pages 55, 56 and 57 there is nothing of any importance.

A.—As the Chairman says, we have covered so much ground in the examination that there is very little left.

Q.—That is why I am hurrying on. I do not think we are wasting time now. I have a note on pages 60 and 61 about this estimate and the 11 crores. I do not know whether you think that subject is exhausted?

A.—Well, I would like to say something about that.

Q.—Just tell me it briefly. This is the somewhat pertinent question put by Sir Frederick Hopkinson in dealing with these 11 crores. He says: "Then it is not an Engineer's estimate?" And Mr. Elgee says: "It is not. It was on a very pessimistic view. It was based on the season's dredging, which we knew could be improved. I do not call that an estimate, although we have put it up at that figure". Then Sir Frederick says: "Who wanted you to put it up?" And Mr. Elgee says: "That was prepared by the Advisory Committee". The only inference from that is that the Government, in the opinion of Mr. Elgee, is not entitled to accurate information. That is the corollary you draw from it?

A.—My point is that when the Government of Bombay began to get alarmed by the Back Bay scheme, they appointed a Committee of Investigation, under the Chairmanship of Sir Lawless Hepper, to go into the matter. This Committee, under the Chairmanship of Sir Lawless Hepper, had no difficulty in attributing the whole blame for everything that had possibly happened to myself, and they produced an estimate showing the probable cost of the works at 1,100 lakhs, and the date of completion to be 1944-45. Well, in view of what Mr. Elgee has said I say that this estimate of 1,100 lakhs—it is a nasty word to use—was in the nature of a fake. It was not an Engineer's estimate, it was not a proper estimate; it was not an estimate that ought to have been sent forth to the world as the final conclusion of the Government of Bombay as to the cost of the scheme.

Mr. Billimoria.—In that connection I asked you a few questions. I asked you what length of time you put for the completion of the scheme, and what would be the amount at which you would complete it, and you said it was impossible for you to answer those questions.

A.—I said it was impossible for me to answer those questions because I have ceased to have anything to do with the scheme, and I have not any of the data at all at my disposal. That is the reason.

Q.—I asked you that question particularly with regard to these remarks of yours.

A.—Yes, but I have not the data. The Chief Engineer of the scheme in reply to a question of Sir Frederick Hopkinson who says: "One gets nauseated with these figures. You are putting the Government in an awkward position," says: "It is not an Engineer's estimate. It was based on a very pessimistic view; it was based upon a season's dredging which we knew could be improved."

Chairman.—But the point may be that the Advisory Committee did not accept Mr. Elgee's optimism about the improvement. After all it was a figure put forward by the Advisory Committee. Mr. Elgee has now put forward a reduced figure of 1,000 lakhs.

Sir M. Visvesvaraya.—That is because the working of the dredger has improved.

Chairman.—Exactly, but the Advisory Committee pledge themselves to 1,100 lakhs even though Mr. Elgee thought that was a very pessimistic view. They said you and your dredger have done 1,020,856,959 yards on the three years' pumping hours instead of 2,000, and in working it out on a basis of 941 yards, the average, it will cost 11 crores, and it will take another 20 years.

Sir Frederick Hopkinson.—They were not satisfied they were going to improve upon it.

Chairman.—They did not believe in Mr. Elgee's optimism.

A.—They do not give all this in their report. They give it as an engineer's estimate, and the engineer comes along and says that it was not his estimate at all. However, I will not labour the point.

Q.—There is not much importance to be attached to the 11 crores.

A.—No.

Sir H. Courthope-Munroe.—As you have mentioned this report (I was going to deal with it at a later stage) I will put two or three questions on it to you now and get rid of it. This is a report of the Advisory Committee dealing with the Back Bay reclamation scheme. Curiously enough in view of the developments of this inquiry, Sir Lawless Hepper was the Chairman of it.

A.—Yes.

Q.—As the real victims seem to have been you, Sir Lawless Hepper and the Chief Engineer—those are the people who are to bear the brunt of it—it is curious that he was made the Chairman of this Committee.

A.—Yes.

Q.—Then I see the Committee reported by a majority of 1 that they were of opinion that "the main responsibility must rest with him"—that is you, Sir George—"for the predicament with which the Government is now confronted." Sir Lawless Hepper was one of them who signed that report of a majority of 1?

A.—Yes.

Q.—Then, like many other reports, I see it had a minority report—it is a minority less the 1—in which they say: "We cannot agree with the majority that the main responsibility must rest with Sir George Buchanan for the predicament in which the Government now finds itself. We are of opinion that the whole responsibility rests with the Government." That was the outcome of it. So if you eliminate Sir Lawless Hepper, the Chairman, it is honours easy. Do you want to say anything more about that?

A.—No, I do not want to say anything further about that; I have exhausted it.

Sir Frederick Hopkinson.—The only thing you might say about that bulky volume is, it is a pity that words will not dredge.

Sir H. Courthope-Munroe.—Then on page 62 there is another searching observation by Sir Frederick Hopkinson about these estimates. He says: "Supposing you are to make an estimate to Government to carry out certain work, and you were asked to give an estimate of what you thought it would cost, what would be your inclination?—(A.) It would be on the safe side.—(Q.) To make it high?—(A.) Yes. So that the whole estimate of cost would really be of little value because the Government would judge if you are going to carry it out departmentally on the nearness of the estimate to the actual cost."

Chairman.—Sir George has dealt with that.

Sir H. Courthope-Munroe.—Very well. Anyhow, you wish to stress that?

A.—Yes.

Chairman.—If the man who estimates is the man who has eventually to do the work, it has been suggested—and we accept it—that it is human nature to be on the safe side.

A.—Yes.

Sir Frederick Hopkinson.—I am simply criticising the principle of it.

Sir H. Courthope-Munroe.—Sir Frederick points out it destroys the meaning of the word " estimate."

A.—The only point I would like to stress is this. Having made this very legitimate criticism of the methods in India of making very, very ample estimates, which I think Sir Frederick called a comic opera business, the harmless remark in my report, " that I never over-estimated because I did not think it was conducive to economy," Sir Frederick was equally discontented with. I say, he cannot have it both ways. That is all I wish to say.

Q.—When you are cross-examined you want it both ways. Then on page 64 you deal with extravagance and inefficiency, and we have heard enough on that. Then on page 66 do you want to lay any stress on that at all?

A.—No; we have dealt so fully with all these points.

Q.—As Sir Frederick put it to the Witness, under the old state of things was not the Chief Engineer in direct control of the whole scheme? Then you refer to the wording of the agreement in Lord Lloyd's evidence, and to the scheme itself.

A.—That is page 67.

Sir H. Courthope-Munroe.—That puts it in another way, as Sir Frederick himself put it to Mr. Elgee, " he was in fact "—" he " is " you " in the context—" just in the position of a contractor, and the Chief Engineer is in the position of a contractor's agent." That is the whole point I was trying to hammer on Saturday.

Chairman.—We heard your argument on that.

Sir H. Courthope-Munroe.—That is the view I expressed on Saturday: do you agree with it?

A.—Yes.

Q.—In no sense could Mr. Lewis, or subsequently Mr. Elgee, be deemed to be your agent?

A.—No. I would like to make one or two remarks on this question, because I think the Chairman was not quite clear that we did not have some contractual obligations.

Sir H. Courthope-Munroe.—I do not think you need say that after what the Chairman said on Saturday.

Chairman.—You mean some obligation in the nature of a contractor's obligation, not contractual?

A.—Of the nature of a contractor's obligation?

Q.—Yes.

A.—I should like to say a few words about that. Sir Frederick Hopkinson when he examined me gave me a number of examples—I forget what they were in detail—as to how the firm really took the place of a contractor. He said we designed the gantry for the sea wall, temporary work which would be done by a contractor in a preliminary report before the scheme was sanctioned. I certainly suggested a plan of operations involving a gantry. Again I showed greater interest and gave more information than was absolutely necessary. In future I must cut my reports and not give nearly so much detail. But supposing the work had been let by contract, obviously it would have been open to the contractor to make any alternative suggestion he chose, but the work being done departmentally, my advice was followed and the work carried on. Then we were told we purchased plant and machinery, that being a contractor's job. We purchased plant on indents furnished by the Development Directorate, and that practice is followed by every consulting engineer in Westminster. To my certain knowledge the Bombay Port Trust and the Calcutta Port Trust have their consulting engineers in Westminister. Whenever the Port Trust require machinery and plant they indent on their consulting engineers who do exactly the same as we did for the Development Directorate. The Calcutta Port Trust are carrying out a large part of a dock scheme departmentally—that is, they are their own contractors—and when they require plant, their consulting engineers in Westminster purchase on indents and send it out. Then we are told because we engaged the staff, a contractor would also engage staff; but the same analogy applies. The consulting engineers to the Calcutta and Bombay Port Trust, and all consulting engineers in Westminster, engage staff for their clients and send the staff abroad. The difference between the usual consulting engineer and ourselves is that as a rule they purchase the plant and send out the staff entirely on their own discretion when asked to do so by their clients, whereas we worked through the High Commissioner for India and the Director-General of Stores. Where we differ essentially from contractors is that we order plant on requisitions; we had no power of discretion, and when as advisers to Government we protested against what we thought extravagance we were

overruled by the Director of Development. We had no control over expenditure in any shape of form; we had nothing whatever to do with the employment of labour, the rates of pay, the letting out of the numerous sub-contracts, the purchase of local materials and stores, and, lastly, we had no power to appoint or discuss any member of the staff or the workmen. That was done by the Chief Engineer in consultation with and taking orders of the Director of Development, and we simply did not come into it at all. Repeatedly in addressing the Chief Engineer or the Director we emphasised the fact that they took the place of the contractor. We used these actual words: "In matters connected with the actual execution of the work we have no authority to interfere with the Chief Engineer's discretion."

Chairman.—Where do you use that phrase?

Sir H. Courthope-Munroe.—I can give you the reference.

A.—It is page 82 of my statement.

Sir H. Courthope-Munroe.—It is on page 91 of the evidence given on Tuesday, the 2nd November. It is only a few questions, and I would like to read it because it is an important point.

A.—There is one more point. In my annual report dated 11th February, 1922, where I went very fully into matters, I made an excuse for expressing my opinion freely by quoting our agreement, which says: "The firm shall at all times assist and advise the Government of Bombay in all matters relating to the execution of the work." That is all.

Q.—Let me just read half-a-dozen questions, and then see if you have exhaustively dealt with it. Sir Frederick Hopkinson said this: "On this question of control I should like to ask you this. In the case of a work of that kind let to a contractor would he design and buy the dredger and take it out in the ordinary way? Suppose you let the work to a contractor, he would design and purchase the dredger?—(A.) That is a matter of arrangement. (Q.) Suppose you let anyone the contract at so much a yard?—(A.) Yes, of course he would. (Q.) He would have a dredger designed, and would buy the dredger?—(A.) Yes. (Q.) He would design the gantry for building the sea wall?—(A.) He would. (Q.) He would settle on what plant was to be used generally throughout the work, locomotives and cranes?—(A.) He would. (Q.) He would also purchase all the plant?—(A.) Yes. (Q.) Or requisition it?—(A.) Yes. (Q.) And he would engage all the staff?—(A.) He would. (Q.) Settle their duties—he would make the dredging programmes?—(A.) Yes. (Q.) He would decide where and how the dredger were to work?—(A.) He would; he would do all those things. (Q.) He would approve or disapprove of buying more plant if it were required?—(A.) Yes. (Q.) All those things you have done." That is what you were on?

A.—Yes.

Q.—You have exhausted that?

A.—I have nothing to add to what I have said. The crux of the whole matter is that the contractor has command of the purse strings.

Q.—Let us leave that and pass on to page 68. There is a matter you wanted to put before the Committee about the moorum. Somebody suggested at some stage that the excavation should be filled up by moorum instead of dredging, and there was a point you wanted to mention about the transport of moorum to the place. It is a question put by Sir Frederick to Mr. Elgee. He refers to your letter in which you say: "We cannot say that we are surprised at the figures and quantities. Calculations made some time ago in this office show that at the present rate of progress the reclamation will be completed in 35 years." You wrote that as a bit of witty sarcasm?

A.—Certainly.

Q.—It rather shows the danger of written sarcasm. Verbal sarcasm may be all right, but when you put it down in black and white it may be misunderstood. You never suggested for a moment that you were going to be a party to this thing taking 35 years?

A.—No.

Q.—You put it in that lurid way in order to draw attention to it?

A.—Yes. It was an attempt to spur them on.

Q.—It was an attempt to spur them on; but written sarcasm is a dangerous weapon. Then you draw attention to this: "There have been two figures, among others, mentioned in connection with the estimates, the figure of 688 lakhs, and 702 lakhs." Sir Frederick says in a lordly manner that there is not much difference between 688 and 702 lakhs; but you point out in round figures it is a quarter of a million of money.

A.—I do not think we need labour that.

Chairman.—We went into that—688 plus 5 per cent. is 702. It was only 5 per cent. difference between Sir George Buchanan's and Mr. Lewis's.

Sir H. Courthope-Munroe.—On the note it runs : " Sir Frederick saying : ' There is not much difference betwen 688 lakhs and 702 lakhs'."

Sir Frederick Hopkinson.—5 per cent.

Sir H. Courthope-Munroe.—It actually works out at something like a quarter of a million of money. A quarter of a million is an important figure even for a contractor to to take notice of.

Sir Frederick Hopkinson.—But when you are dealing with large figures you must take the percentages.

A.—I do not think we need deal with that.

Q.—All right. Then as to the " Kalu " and " Jinga," you told us you did not recommend their purchase, and I think in connection with some part of the work you used the word " disgraceful."

A.—I did.

Chairman.—About the " Kalu " I think Sir George did agree that he recommended its purchase, but that was probably for the East Colaba reclamation which fell through, but in terms he eventually agreed that he recommended her as a suction dredger, but he qualified it by this, that before she was agreed to be purchased she ought to have been examined. That is the point?

A.—Yes.

Sir H. Courthope-Munroe.—Am I right in saying that for the cost £75,000 plus £25,000 repairs, you could almost get a new one?

A.—Yes, you could.

Sir Frederick Hopkinson.—Not at that time. She originally cost £65,000.

Sir H. Courthope-Munroe.—You know more about these things than I do, but I thought that was the fact. If Sir George had known it would cost £75,000 and you had to put on £25,000 repairs to that, he would have said no.

Sir Frederick Hopkinson.—She originally cost about £65,000.

Chairman.—I think it is £56,500.

Sir H. Courthope-Munroe.—It is another example of the way that prices were jumping up.

A.—Then shall we go on to page 78?

Sir H. Courthope-Munroe.—Anyhow, you say apart from the purchase of it the management was absolutely and entirely a matter for the dredging masters?

A.—Yes.

Q.—There is something in Mr. Speirs's evidence about working the dredger?

A.—We have dealt with that.

Q.—And Mr. Merrett's also?

A.—Yes. Then page 78.

Sir H. Courthope-Munroe.—Then on page 82 this same sarcastic observation of yours crops up : " That the work would go on to 1960."

A.—Yes.

Q.—You did not suggest that was business. Then on page 38 there is a mistake. It is suggested that you were the man who selected the site. Is that right?

A.—No; I did not select the site. I understand through the Chairman that the Committee see that I was not responsible for the site on which the dredging operations were to take place, and the neglect of the Government to ascertain that the Port Trust had certain powers.

Q.—Then on page 85 you have commented upon whether there should have been a land station, or whether the booster should have been on the water.

A.—I do not think I have anything more to say about any of those points.

Q.—Then there is a reference on page 86 to the wonderful natural siltation referred to in paragraph 19 of the Sub-committee's report. Do you want to say anything about that?

A.—No; I have already expressed my view about that. There is a great deal of repetition here.

Q.—That is why I am running it through rapidly. Is there anything on page 87?

A.—No.

Q.—Do not touch on anything which you do not think is necessary. On page 89 there is a reference to the moorum and to the railway facilities. Sir M. Visvesvaraya put a question about that, and at one time you thought that it wanted a little clearing up. Will you just see whether you want to say anything more about that?

A.—I have nothing to say, except for Sir M. Visvesvaraya's information I may point out that Mr. Lewis, the chief engineer—I hoped to have his letter here, but I

will put in his letter—wrote a letter on the subject of moorum and went into the question of the number of trains required and the quantity that each train would take, and his figures were most disappointing. If it is of any interest I can put his letter in amongst the papers.

Chairman.—What date would that be?

A.—That would be somewhere about 1922.

Sir M. Visvesvaraya.—I should like to have that.

A.—Sir Lawless Hepper had prepared a scheme for doing it, and he was going to have a new railway and a large tunnel across the island. You have not got that, perhaps?

Sir Frederick Hopkinson.—We have got that somewhere.

Chairman.—We have had a suggestion of a tube railway which should be handed over to the people of Bombay as a further piece of the beneficence arising out of this work.

A.—Yes.

Sir Frederick Hopkinson.—A tube railway taking about 20 years to complete, and then the reclamation would be begun.

Sir M. Visvesvaraya.—There is a scheme for a tube railway in Bombay.

Sir Frederick Hopkinson.—But this was to bring the moorum down.

Sir H. Courthope-Munroe.—On page 93 I see an answer was given by Mr. Elgee which is a little illuminating. Sir M. Visvesvaraya says this : " If Sir George Buchanan did not give the specification why did the engineers on the spot not do it? " The answer given by Mr. Elgee is : " One reason is that at the commencement of the work Mr. Lewis was very busy, and he gave us a free hand, more or less, in the working." You might paraphrase that by saying that Mr. Lewis did nothing.

A.—He had the specification in his possession. Two copies were given to him.

Sir H. Courthope-Munroe.—For the man who is in charge to give a sort of, what is called, a free hand in working, is another way of saying he is doing nothing.

Chairman.—You must remember the reason. Mr. Lewis, immediately after his return from London, begun to get out his project estimate; and that was published early in 1922. It was a gigantic labour, and Mr. Lewis, instead of being able to go about the works and energise this man and push on the other man, and be at Kandivli in the morning and at Marine Lines in the afternoon, was chained to the office. To get out that detailed project estimate was an enormous labour.

Sir H. Courthope-Munroe.—I understand that. Of course you have had the advantage of knowing what has happened earlier on in this inquiry?

A.—If he had not been tied by the rules and regulations laid down in the Public Works Department, Code By-laws 1, 2, and 3, as to how the estimate should have been got out, he would not have been tied. There are heaps of large works—and Sir Frederick Hopkinson will bear me out—that are started on very meagre information, and the details are worked out step by step as the work proceeds. You do not necessarily do as the Government of India does. The situation may be changed entirely next year. The Government were insisting on their putting everything down on paper—" everything before we let you start," although it might be a waste of paper in six months' time.

Q.—Is there anything you want to say about page 96?

A.—That is a question put by Mr. Billimoria. Mr. Billimoria, on the information available in Bombay, suggested : How should an engineer of repute and standing make such colossal mistakes? With all due deference to Mr. Billimoria, I hope that he has changed his mind since he has heard the London evidence; and I wish to say I do not admit making colossal mistakes; and I hope Mr. Billimoria's opinion was framed on what everyone was saying in Bombay at the time. That is all I have to say about that.

Q.—That brings us to the end of this part. You have made a note about the evidence given by Mr. Walsh and Mr. Hirachand?

A.—I think we have dealt with that.

Q.—That concludes all I want to ask you about the Bombay evidence?

A.—Yes.

Chairman.—It had better be made clear that when you refer to page 3, or page 5, or page 8, and so on, you are referring to a document which no member of the Committee has, but which is a document which is brought into existence for your use in the examination of Sir George Buchanan.

Sir H. Courthope-Munroe.—Yes.

Chairman.—The reference which you have given will not be to these pages of evidence.

Sir H. Courthope-Munroe.—That is so. You will appreciate that the little book I have got before me has 98 pages, and the Bombay evidence has been boiled down to that. You will know the number of pages of evidence that I have dealt with. If I had waded all through that it would have been a question of days; therefore I purposely reduced it.

Chairman.—It is only that somebody reading the evidence should not hurriedly turn to page 18 of the transcript and not find the reference.

Witness.—The boiling down of the evidence was done before my examination, so that we were just going over it to see that nothing was missed.

(*Adjourned for a short time*).

Sir H. Courthope-Munroe.—I have had a copy made of the letter of the 13th April, 1922, and it will be handed in. (*Letter put in.*) (*To the Witness.*) We are now nearing the end of our labours. Will you turn to the London evidence. I think you have gone through it since lunch, and you have further reduced the questions. Will you turn to page 3. I think you want to refer to the question in the middle of the page?

A.—That is right.

Q.—It was suggested, I think, that you took Mr. Kidd's report holus bolus, and that is what is still rankling in your mind. What do you say about that?

A.—No, it is not rankling. I only suggest that the statement that I took Mr. Kidd's report holus bolus was made before I had given any evidence, and I think it is quite clear now from all the information that I have given that I did not take his report holus bolus. I have nothing more to say.

Q.—I think we can now turn on to page 7. I have referred to this already. This is what Sir Henry Lawrence said in answer to Sir Frederick Hopkinson?

A.—We have already referred to that.

Q.—I have referred to it, but it emphasises that there was some difficulty with the crew, some of whom had to be replaced?

A.—Yes.

Q.—Sir Henry Lawrence says: "Some of them had to be replaced on the vessel because their work was unsatisfactory in every way. Fresh men had to be trained in the following year"?

A.—Yes.

Q.—Now will you go to the middle of page 8?

A.—Yes.

Q.—It is the same old story?

A.—It is the same old story. I can hardly think that Mr. Billimoria, after having heard me, would still subscribe to the statement that I "followed blindly the report and figures of Mr. Kidd."

Q.—That follows the holus bolus suggestion. I think we can pass on?

A.—Yes.

Q.—You have given your explanation of that. We can now skip several pages. I think you desire to draw attention to one answer that was given by Mr. Kidd. The question was put by the Chairman: "And a scheme which might very well be a complete success if the dredger worked to expectations, might be a disastrous failure if she gave an output such as that of the 'Kalu' and 'Jinga'?—(A.) Clearly. May I just mention one very important thought which is passing through my mind which is very well illustrated by the case of these two vessels and the figures you have just given. It is a question of the men who are working. It may be much more a question of the men who are working the machine than of the machine itself"?

A.—Yes.

Q.—That puts your own view in a nutshell?

A.—That puts my view in a nutshell.

Sir Frederick Hopkinson.—And the men controlling those who are working?

A.—The men controlling those who are working, obviously.

Sir H. Courthope-Munroe.—I think I can skip the next nine pages. The next reference I have is at page 19. What do you want to say about that?

A.—I agree with Mr. Kidd.

Q.—That is again a reference to the borings?

A.—That is a reference to the borings, and I agree with Mr. Kidd.

Q.—On page 19 this question is put by Sir M. Visvesvaraya : " Do you think that any changes have occurred in the bed of the harbour since the borings were taken in 1912?" and the answer is : " It is extremely improbable." Of course those are the borings upon which you were relying. " (Q.) Do you think that dependence could be placed on the surveys in 1912 in designing in 1919?—(A.) Surely. (Q.) You do not think there would be any deposits or erosion of the bed likely?—(A.) The only thing that might have happened in the interval would be a further accumulation of soft mud. Bombay Harbour is gradually shoaling, becoming shallower."

A.—Yes, I subscribe to that.

Q.—Then he goes on to deal with the question of the shifts. There is nothing more to which you desire to draw attention, is there. Can we pass to page 23?

A.—Yes.

Q.—Here, I think, you want to draw attention to the answer given by Mr. Kidd in connection with the matter of the bonus?

A.—That is the point. I have already stated it in my evidence, but I would like to emphasise what Mr. Kidd says : " But I have sometimes wondered whether the magical effect of a bonus would not have procured very much better results." Then he says that he took a Port Trust dredger on hire, and that he got outputs far exceeding the best which had ever been obtained by the Port Trust, and he attributed it solely to the fact that the boat crews had a bonus on results.

Q.—He says : " Yes, and I attribute those better results solely to the fact that I paid the crew a bonus on results."

Sir Frederick Hopkinson.—A bonus is paid for getting something above the normal?

A.—Yes.

Sir H. Courthope-Munroe.—It used to be.

Sir Frederick Hopkinson.—It should be paid for nothing else.

Sir H. Courthope-Munroe.—We may be living in different days now.

Witness.—With a bonus the men are always hoping to get something beyond the normal, and they get up to the normal.

Sir Frederick Hopkinson.—They are paid to do the normal.

Sir H. Courthope-Munroe.—Is there anything on page 26?

A.—No, there is nothing there.

Q.—I think you have dealt with that question, and I will leave it?

A.—I have dealt with that question. At the top of page 26 Mr. Kidd says : " I have always been amazed at the simple fact that Sir George Buchanan's original estimate after the war was a lesser figure, or an approximate figure to mine made in 1912. That has always been an incredible fact to me." I have explained that, and I adhere to it.

Q.—I think the Committee are in possession of your views upon that. Now we go to the evidence of Mr. McMurray at page 31. Do you want to refer to page 26 at all? I have nothing marked on that?

A.—No, I think that is all.

Q.—On page 29 you are dealing with Mr. McMurray's evidence, and your comment is : " It has been established, I think, that on their trials in Bombay these dredgers did 37½ per cent. above their guaranteed delivery."

A.—I have already spoken upon that subject.

Q.—I thought that that was what you wanted to refer to?

A.—Yes, but you understand that so much has happened since this compilation was made.

Q.—I thought that that was one of the pages that you marked?

A.—Yes.

Q.—You draw attention to page 31. What is it that you want to say with regard to that?

A.—Mr. Kidd emphasises, as it is recorded, that when he put the " Jinga " on to the blue clay she gave much better results than when she was dredging mud alone.

Sir Frederick Hopkinson.—I do not think we have any evidence at all that Mr. Kidd ever did any dredging there?

A.—He said that he persuaded Mr. Messent to do it, and he pointed to the figures which he marked in green as showing the better output when the " Jinga " was working in blue clay. Then Mr. McMurray remarks : " I cannot accept anything of the kind."

Sir H. Courthope-Munroe.—What is the next matter to which you desire to call attention? I have nothing marked in the next few pages.

A.—I have got to Mr. Lewis's evidence now, at page 42.

Q.—I have something marked on page 41. The question was put by Sir M. Visvesvaraya to Mr. McMurray, that the actual test with the dredger on the Clyde was farcical. What do you say to that?

A.—I have already said all that I can say. I was not present at the tests.

Q.—You did not superintend the tests. That was done by the naval architect in England?

A.—By the naval architect, and my partner was there, but I have said all that I can usefully say upon that.

Q.—If you were not there, that is a matter which more concerns him than you?

A.—Yes.

Sir M. Visvesvaraya.—Was it not necessary under the contract that you should pass the dredger? Was it not necessary that the dredger should be tested by Messrs. Meik & Buchanan according to the terms of the contract?

A.—Mr. Meik was present at the trial.

Q.—Mr. Meik was there?

A.—Yes, he was present at the tests.

Q.—At all the tests?

A.—At all the tests of both dredgers? I was in India.

Chairman.—He sets out the records at page 31 of this big book of correspondence.

Sir H. Courthope-Munroe.—At page 45 the question crops up again of beginning both ends of the wall at once, but you have dealt with that?

A.—I have got to page 54, and I cannot find anything to which I want to refer.

Q.—Do you want to say anything with regard to page 54?

A.—No, I have nothing to say as regards page 54. At page 55 Sir Frederick Hopkinson asks Mr. Lewis: "Had Sir George Buchanan a clearly defined scheme for doing every detail of this work? Did he tell you that he wanted a gantry here and he wanted to use so many trucks there, and locomotives here, and so on?" I say no, I was not carrying out the work; that was left to the Director of Development and to his chief engineer.

Q.—On page 58 there are two matters that you wish to clear up. I see that Sir Frederick Hopkinson, in asking some questions of Lord Lloyd, by error, no doubt, assumed that you had said certain things. At page 58 the question is put by Sir Frederick Hopkinson: "He (the Secretary) was casting doubt as to whether it was wise to do this reclamation by means of dredging, because the experience of the employment of suction dredgers on a large scale with limited and reclamations in a large scale were limited." That is the context. Then Sir George Buchanan rebuts that by saying: "I am therefore to point out that the large reclamations being carried out by the Port Trust afford exceptionally complete data for estimating work of this kind." I think, in point of fact, you never said anything of the kind?

A.—No.

Chairman.—That is a quotation from a letter.

A.—That is a quotation from a letter.

Sir H. Courthope-Munroe.—As it appears there it looks as though Sir George Buchanan had said it. It is quite clear that he did not say that.

Chairman.—I do not think it was Sir Frederick Hopkinson who asked the question. I think I put the question, and I have corrected it in the proof, because I realised that it was not right; it will be corrected.

Sir H. Courthope-Munroe.—On my notes it appears in that way.

Chairman.—I have got that in mind. I think it was I who put the question.

The Witness.—You have dealt with Lord Lloyd's evidence.

Sir H. Courthope-Munroe.—Yes. I am not going to touch upon that, because I have dealt with that fully. As I said on Saturday, I think you agree with every word of Lord Lloyd's evidence?

A.—Yes.

Q.—You are not in conflict with any of it. I think there is nothing that you want to say about Lord Lloyd's evidence beyond what I have already said?

A.—No, nothing.

Q.—I think that concludes your comment, in substance, on the London evidence, does it not?

A.—Yes.

Sir H. Courthope-Munroe.—I hope the Committee will not think that I have been too long in dealing with that?

Chairman.—No.

Sir H. Courthope-Munroe.—There remains only a few general matters to clear up.

Chairman.—There is one question I should like you to ask Sir George Buchanan on Mr. McMurray's evidence. Mr. McMurray made a very strange statement: That he had told Sir George Buchanan that whilst he was only giving him a soft clay dredger he must recognise that the dredger would work much more slowly in any other substance than soft clay. I should like to know if Sir George Buchanan remembers any conversation of that kind with Mr. McMurray.

Sir H. Courthope-Munroe.—Will you deal with that now?

Chairman.—He said it took place at Renfrew

A.—I think I stated in my evidence that when I was at Renfrew I had an interview with the firm. We discussed it with Colonel Brown, who is now dead.

Q.—That is quite right.

A.—Yes. Colonel Brown realised I had stated the material as clay and asked what I meant. Then we said it was the same material as the "Jinga" and "Kalu" had done, and we agreed that soft clay, which was the designation used for the material for the "Jinga" and the "Kalu," was the medium. Whether it was said or not, naturally anybody knows that if the dredger dealt with anything much harder than soft clay the output would probably be reduced.

Q.—Mr. McMurray in his evidence has made it clear to us that the reason why the firm would not give a test on site was because he knew that he would come up against material in the harbour that could not be described as soft clay. That he was concealing from you knowledge that he had in his head, if he was telling us the truth?

A.—There was no conversation on those lines with him. If he thought there was very much harder stuff in the harbour he certainly did not tell me so.

Q.—Yes. In answer to Sir M. Visvesvaraya he said definitely and plainly that the reason why he would not agree to a test was because he knew there would be hard stuff in the harbour, and he pledged himself to it all the way through, that they had given this soft clay description as regards the dredger obviously to limit their liability. Sir Frederick Hopkinson put to him whether he was not tricking you in relation to it.

A.—He certainly never gave me any suggestion of that kind.

Q.—He never gave you any hint that you might come up against hard material?

A.—He never gave me any hint in that respect.

Sir Frederick Hopkinson.—He claimed to have a thorough knowledge of all the clay in Bombay Harbour?

A.—So did Mr. Kidd. They were both out there when the "Jinga" and the "Kalu" were working. I understand that when they were working at Sewri there were a number of stones which had been deposited in connection with some quarrying operations. They were not part of the original soil, but a number of large stones had got on to the ground, and that gave a good deal of trouble to the dredgers; whether Mr. McMurray was guarding himself against anything of that kind I do not know.

Sir Frederick Hopkinson.—No.

The Chairman.—He did mention that it was the hardness of the material, the moorum and rock.

Sir Frederick Hopkinson.—And the clay.

Chairman.—And the clay. He may not have been playing very, very candidly with you either just before the 25th of July, or on the 29th of August, but that is how the matter seems to stand on the evidence?

A.—Yes.

Sir H. Courthope-Munroe.—I have not seen that part of the evidence to which the learned Chairman has referred, but I notice that in your letter which I read this morning, dated the 25th of August, 1919, when you opened the ball and asked Messrs. Simons for their estimate for this dredger you stated: "I shall be satisfied with a test in this country and your guarantee that the plant will do the work required"?

A.—Yes.

Q.—Rightly or wrongly, from your point of view, you never anticipated a trial elsewhere than in England?

A.—No, I did not.

Q.—It follows.

A.—Yes.

Sir Frederick Hopkinson.—That was never incorporated in the contract.

Sir H. Courthope-Munroe.—Yes. This is the letter that opened the ball.

Chairman.—No. What opened the ball, as you can see from that letter, was an antecedent interview with Mr. McMurray, because you will see that that letter says: "' He and I are in general agreement about the nature of the plant required.'"

Witness.—That is correct.

Q.—That is what happened, and then the suggestion that there should be a trial at Bombay was turned down?

A.—Yes.

Q.—Then in the latter dated the 25th of July, 1919, you say: "I am willing to have a trial on the Clyde, and then I want a guarantee that the plant will do the work required." Mr. McMurray never gave a guarantee, nor did Messrs. Simons, that the plant would do the work required. They are too canny. They never gave that guarantee. They were giving no guarantee as to performance in Bombay. Mr. McMurray was quite definite about that.

A.—Yes.

Sir H. Courthope-Munroe.—In point of fact, the test did take place, I understand, on the Clyde.

Chairman.—Yes, that is right.

Sir H. Courthope-Munroe.—Does that conclude your question?

Chairman.—Yes.

Sir H. Courthope-Munroe.—(To the Witness.) I think there are only one or two general matters left now. This is not, as we know, the first big job that you have undertaken.

A.—No.

Q.—You have a job, I think, in Scotand now that is even bigger than this?

A.—We have a very large work in Scotland at the present time.

Q.—Is this the first time that it has been suggested that your work has turned out a failure?

A.—Absolutely—it is unique.

Q.—Has all your work, with one exception, been on the lines that I indicated to the Chairman as being the usual lines for foreign work, where the Resident Engineer has been your servant and your representative?

A.—No.

Q.—I think there is one case.

A.—No. There was one case where the Resident Engineer was appointed on similar lines to Mr. Lewis, and the work was a complete success; we had no trouble.

Q.—I think there is only one case where you have done work for a Government more or less on these lines?

A.—We have done one work for a Government on these lines, and we were fortunate in having no Development Directorate to deal with, and the work was an absolute success, and we were congratulated upon it. We have been doing another work exactly on these lines for a large private company in Italy, and there also the work was carried out to a complete success. We have two examples within my knowledge of works carried out on similar lines, but they were a success, and if we had suggested for a moment that our Resident Engineer ought to have gone he would have gone within twenty-four hours.

Q.—With those two exceptions, your work has been on the general lines of the Resident Engineer being your servant, payable and dismissible by you, and, as I say, your eyes abroad?

A.—Yes, and the work has been done by contract.

Q.—You have told us all about Mr. Lewis. There is one other matter only that you have noted here. Sir Frederick Hopkinson, I think, rather pressed the point that in this work you ought to have had what I think he described as a double stage pump?

A.—That was in the statements; I have dealt with that.

Q.—There are two sides to that question?

A.—My reply really is that the question is one which ought to have been dealt with by the Naval Architect, Sir John Biles. It was a technical matter. I am not an expert in pumps. I tell you that at once, and I think that Sir John Biles might reasonably have been asked that question.

Q.—Sir Frederick Hopkinson has put one side of that, but there is another side to it, is there not?

A.—I would rather leave it.

Q.—You have dealt with the question of your estimates, and I think you have expressed your regret that this Committee has not got a few Westminster engineers on it, as well as the present personnel. You are quite willing to hand over these estimates to any two or three Westminster engineers for them to say whether they were in the ordinary form or not?

A.—Certainly. I will welcome any investigation by a tribunal of Westminster engineers.

Q.—Is there anything that you have mentioned to me to which you wanted to refer? There is one little matter in Mr. Settle's Report. We took Mr. Settle's evidence at the end of the day, and his Report was put in, but I do not think very many questions were asked upon it. Is there anything on which you want to lay stress, and direct to the attention of the Committee upon that Report?

A.—I would like to stress the point that Mr. Elgee, in his evidence, I think, said that Mr. Settle had been there for only three or four days. As a matter of fact he was there for four weeks. He went out when I was very ill to do anything he could to help in this matter. I should have been there except for illness, and he was there for four weeks, not two or three days, and he reported to us. He made numerous suggestions, but I doubt very much whether any of them was given effect to.

Q.—Is there anything in the Report to which you want to call the attention of the Committee?

A.—He told them very definitely that they ought to devote less time to work unconnected with the dredging, and concentrate on the dredging. He showed them how to dredge. What I would really like to emphasise is that in my absence we did everything that we possibly could to help matters. We sent out Mr. Settle at our own expense. We were prepared afterwards that Mr. Halcrow himself should go out. We did all that human beings can do to get a move on when we found the way in which things were going.

Q.—Have we come to an end of this, or is there anything else?

A.—I should like to make one remark about which there has been some misunderstanding. Sir Frederick Hopkinson, at the close of the last hearing, asked whether I considered, putting it in bald language, we had earned our fees, or words to that effect.

Sir Frederick Hopkinson.—I do not think that is a fair way of representing anything that I said?

A.—I do not want to represent anything unfairly. That is my bald way of putting it. What I am going to say is that I think Sir Frederick Hopkinson knows that our fees for actual work done have been less than those usually charged by Westminster Engineers.

Q.—I am not prepared to agree to that.

A.—And considerably less than the Colonial Office pays for similar work. Those are matters that can be proved.

Sir H. Courthope-Munroe.—I do not think that it is a matter we need pursue very much.

A.—No. I merely wanted to point that out.

Q.—I suppose that the reason why they are less, as you say, is on account of the magnitude of the job?

A.—It is a matter of comparison; they are less.

Q.—Is there anything else?

A.—I should like to go on with that. I say that I carried out my bargain to the fullest extent. I let pass other equally remunerative work, and, so far as money goes, I should actually have been just as well off if there had not been any Back Bay Reclamation Scheme. It was not a money-making concern, particularly to me. It was a large work in which I was interested.

Q.—As far as money goes, you would have been better without it, and as far as vexation, trouble, and worry go, you would have been well quit of the whole thing?

A.—Absolutely.

Q.—Is that all?

A.—That is all. Sir M. Visvesvaraya was asking me about moorum, and I said before lunch that I would give him an extract from a letter from Mr. Lewis on the subject of moorum filling. I will read it, and then I will put it in with the other documents. It is dated the 14th of May, 1921: "I wonder whether you have ever considered the question of the moorum topping to the reclamation? I have just taken out a few figures. The amount of stuff to be shifted is approximately 100 millions of cubic feet, with trucks taking 400 feet, this means 250,000 trucks. 5,000 trains of fifty trucks each, and at two trains a day, would require 2,500 days, or some eight years. If the work is to be done in two years then we shall have 600 days to work in, and shall require 8·3 trains per day. The B.B. and C.I. what with their quadrupling, the rebuilding of Grant Road Terminal Station, and the electrification of the line, will probably be in a state of chaos for ten years to come, and will never be able to handle that amount of traffic. The problem is will the moorum be necessary, and, if so, will it be possible to get the amount of material and transport it in the requisite time?" Then we come on to Sir Lawless Hepper's idea of an underground railway.

Sir Frederick Hopkinson.—That deals only with moorum topping, not moorum filling.

A.—That is so, but what I want to point out is that if there is all this tremendous question with reference to moorum topping——

Chairman.—One foot of moorum.

A.—If there is all this tremendous question about one foot of moorum, what about your colleague's desire to fill up the whole area with moorum?

Sir Frederick Hopkinson.—He prejudices at once the statement that he makes by saying that the B.B. & C.I. will be in a state of chaos for 10 years. This is in 1921.

Sir M. Visvesvaraya.—Things are quite different now.

A.—Yes.

Sir Frederick Hopkinson.—He is prejudicing the statement that he makes.

Sir H. Courthope-Munroe.—Does that conclude the matter, or have you anything else on your notes to which you wish to refer?

A.—No, I have nothing more to say at all.

Sir H. Courthope-Munroe.—That concludes all that I want to ask Sir George Buchanan. Before the Committee terminates this Inquiry, so far as the hearing of the evidence is concerned, Sir George Buchanan wishes me, on his behalf, to thank you for the full and patient hearing that you have accorded to him. He wants me also to remind the Committee of the terrible strain and anxiety imposed upon him by this Inquiry, which is unique in his experience, should he have, in the course of the Inquiry, appeared to resent some of the questions that duty has compelled the Committee to put to him.

Chairman.—No, it is quite the contrary. I am sure that we are all agreed that no one could have been in the witness-box for such a length of time as Sir George Buchanan has been, and have comported himself more charmingly and exactly in every possible way.

Witness.—I thank you.

Chairman.—It is only fair to say that.

Sir Frederick Hopkinson.—I entirely agree.

Chairman.—We are all agreed about that.

Sir M. Visvesvaraya.—We are all agreed about that.

Chairman.—We are very much obliged to you, Sir George. We realise that it has made a tremendous demand upon your time, and we do appreciate very much the manner in which you have dealt with every matter that we have put before you.

Witness.—I am very glad indeed if I have been of any assistance, and I say again what my Counsel has said, that I very much appreciate the courtesy shown to me by you, Mr. Chairman, and by your colleagues.

Chairman.—We are much obliged to you also, Sir Harry.

(*The Witness withdrew.*)

APPENDICES TO THE EVIDENCE RECORDED IN ENGLAND.

(I.)

Questions formulated by Committee and publicly announced at first sitting in Bombay on 3rd August, 1926, and referred to by witnesses in India and England.

The following are the subsidiary questions in so far as we have at present been able to formulate them :—

1. Before the decision to undertake the scheme was arrived at, was it fully explained by the Government of Bombay to the Government of India and the Secretary of State in Council, and was it embarked upon with their approval and sanction?

2. Before deciding to undertake the scheme did the Government of Bombay have any, and what, correspondence or consultations with the Port Trust and/or the Royal Indian Marine and any or what other public body, syndicate or persons in relation to :—(*a*) the feasibility of the scheme, (*b*) their experience of dredging operations in the harbour, (*c*) the nature of the sea bed, (*d*) the proposal of Sir George Buchanan to dredge in the area subject to their jurisdiction?

3. Did the Government of Bombay communicate to the Port Trust and/or the Royal Indian Marine (i) the report of Mr. Kidd, "Project of 1912," (ii) Sir George Buchanan's Report of September 1919, (iii) any other and what documents, and seek advice, opinion or information from them or either of them?

4. If so, did they or either of them raise any and what objection to the site of the proposed dredging operations?

5. At what date did the Government of Bombay and/or the Development Directorate learn that the Port Trust and/or the Royal Indian Marine objected to dredging in the harbour? Were the said objections verbal or in writing? To whom were they made and what were the reasons alleged?

6. Did the Government of Bombay and/or the Development Directorate accept the objections as well founded? Were the undertakers of the scheme thus deprived of a dredging area calculated to yield 15½ million cubic yards, or some other and what estimated amount? Was this part of the area over which Mr. Kidd had made some and what number of the 1,314 borings? Was this area stated to contain material eminently suitable for dredging?

7. Did the Government of Bombay and/or the Development Directorate and/or Sir George Buchanan decide to dredge material from some other and what area? On what date and by whom was this decision made?

8. Before commencing dredging upon the new area were the Development Directorate and/or Sir George Buchanan satisfied by any and what surveys, borings or tests that as to quality and extent of material the new area was suitable for dredging?

9. Was it in fact suitable for dredging? What were the results obtained in the dredging operations in this new area, season by season? What (if any) was the additional cost? To what extent (if at all) was the work thereby delayed?

10. What were the functions of the Development Directorate in relation to the Reclamation Scheme?

11. Had any, and which members thereof, previous practical experience of reclamation upon an open sea front, or any practical experience analogous thereto?

12. Did the personnel of the Development Directorate carry out their duties efficiently?

13. In the circumstances of unsettled financial, trade and labour conditions as they existed in 1919 and 1920, would it have been practicable to carry out the work through independent contractors, or was it a wise decision on the part of the Government of Bombay to carry it out departmentally?

14. Was the urgency of the scheme so great that, notwithstanding the aforesaid unsettled conditions, it was prudent and reasonable to undertake it in 1920?

15. Was Sir George Buchanan's estimate of time and cost based upon a dredger working 15 hours a day and delivering each hour 2,000 cubic yards of dredged filling to the site to be reclaimed?

16. Was it practicable to work a dredger for such a length of time each day? If so was it, in fact, done, and throughout what period? If the dredger did not work for 15 hours a day why did it not do so?

17. Were the specifications and designs of Sir George Buchanan for the dredger *Sir George Lloyd* (hereinafter called the dredger) and the *Colaba* fit and proper for the intended work?

18. Did the makers guarantee that the dredger would discharge 2,000 cubic yards of soft clay per hour through a floating pipe line to a distance of 5,000 feet?

19. Did the dredger before delivery under proper test conditions in fact give the guaranteed output?

20. Was the dredger and the *Colaba* when delivered, in all respects in accordance with the contract? If not, in what respect or respects did one or other or both fail to conform thereto?

21. For how many days did the dredger work, and for how many hours of each day in the seasons of :—(I) 1923-24, (II) 1924-25, (III) 1925-26?

22. What was the amount of material dredged from the sea bed and the amount deposited and retained throughout each of the periods respectively? How does it compare with the estimate of Sir George Buchanan of 30,000 cubic yards per working day delivered on the reclamation site?

23. As regards the dredger *Kalu*, when did she commence work? What was her guaranteed output? Did she give the said output? What was her actual output for each and every day she worked?

24. Did any and what estimated amount of dredged filling escape through the rubble wall?

25. If any did so escape, was that in consequence of any defect in the original design of the said wall, or because of some and what departure from the original specification, or some other and what cause?

26. Were the operations carried out by those in charge of the dredgers and pumping station with all reasonable skill and diligence?

27. If the amount of dredged filling is found to have fallen below the estimate of deposit, to what is this deficiency due?

28. If we decide to recommend that the work should be continued wholly or in part, should it be carried out by (i) the Development Directorate, (ii) the Public Works Department, (iii) independent contractors, (iv) or some other and what agency?

29. Should any future reclamation be effected by (*a*) dredged filling, (*b*) dry filling, (*c*) or a combination of the two?

30. What could be the probable cost occasioned and length of time required to complete Block 8? Is its completion in the circumstances a reasonable business proposition?

31. What would be the probable cost occasioned and length of time required to complete Blocks 1 and 2? Is the completion of these in the circumstances a reasonable business proposition?

32. If we decide to recommend that the work should proceed on one or more of the said blocks, should a recommendation be also made (i) to continue the filling in of Blocks 3, 4, 5, 6, 7, or some and which of them? (ii) Or should the scheme be abandoned as far as they are concerned? (iii) Should the question of continuing the reclamation of some or all of the blocks 3, 4, 5, 6 and 7 be suspended until the financial results of any reclaimed blocks are known or can be estimated with fair certainty?

33. When and under what circumstances was the original estimate of 367·61 lakhs increased to 702·43 lakhs; and the eventual cost now estimated at 1,101 lakhs? What are the figures which make up the two latter amounts?

34. Who decided upon the system of building the reclamation wall and the quantity required for it?

35. Was this a proper and economical system or could a better one have been devised?

36. Why were the 20-tons blocks shown on the 1919 scheme abandoned and when and by whom was it decided to abandon their use?

37. Generally, if the work has not been carried out in accordance with Sir George Buchanan's estimate, can it be said how and in what manner the failure has arisen, and to whom it is attributable?

(II.)

Letter from Sir J. Biles of 8th October, 1926.

SIR,

With reference to the request made by Sir Fredrick Hopkinson as to the changes in costs of production in ships during the periods ranging from 1920 to the present time, I have to state that as far as I am able to determine :—

The maximum cost of ship materials occurred in the third quarter of 1920. By the beginning of 1923 these materials had fallen to about what they were during the last two years of the War, which latter were about 55 per cent. above pre-War prices.

As regards labour, the cost did not fall in 1921, as there was a good deal of work being completed which had been begun in the periods before 1920.

In August, 1923, the total prices of ships were about 55 per cent. of those for ships building between 1919 and 1921.

We may take it that ships cost in 1920 three times pre-War prices and in 1921, 3¾ times, while in 1923 they were costing about twice as much.

Vessels are being placed now for about 60 per cent. above pre-War.

With reference to the cutter of the " Sir George Lloyd " and the possibility of increasing its revolutions above those obtained with 150 horse-power, I have to suggest that the following should be considered :—

(*a*) The engine should be run at as high a mean pressure as the steam will carry, thereby obtaining as many revolutions as is practicable in cutting the particular clay that is being cut.

(*b*) If it is found that the rate of cutting is not thereby increased, it would be practicable by altering the train of wheels in the cutter to lower the revolutions and get a more powerful cut on the clay. These reduced revolutions with the more powerful cut might increase the total output.

(*c*) If neither (*a*) nor (*b*) produces the desired improvements, a smaller cutter could be made.

Any result produced in this direction must depend on the hardness of the clay, which can only be determined by cutting it with the existing or modified cutter under the suggested conditions.

It is to be remarked that as already stated in my evidence while making the cutter more suitable for cutting hard clay it may be made less suitable for cutting the soft clay (and mud) for which it was originally intended, and while the output in hard clay may be improved, the total output in all materials might not be.

With reference to the point that Sir Fredrick Hopkinson tried to make, viz., that if the actual velocity of the water in the pipes was only 12 ft. per second instead of 14·1 to 14·8 as demonstrated from the actual pressures in the pump, it would be interesting to know under what conditions this velocity of 12 ft. was measured and what was the actual pressure in the pump at the time, and the lengths of the pipe line.

Yours faithfully,

(Sgd.) J. H. BILES.

(III.)

Letter, dated 25th July, 1919, from Sir George C. Buchanan to Messrs. William Simons & Co.

DEAR SIRS,

I have been asked by the Government of Bombay to report on the proposed Back Bay Reclamation scheme and I shall be much obliged if you will give me an estimate accompanied by a plan for the dredging plant required.

2. I have already had the advantage of discussing the matter with Mr. McMurray and I think we are in general agreement as to the type of plant necessary.

3. The enclosed plans show broadly what is required. It is proposed to build a wall enclosing an area of some 1,200 acres in Back Bay and to reclaim the land by dredging in Bombay Harbour and pumping the dredged material through pipe lines across the Colaba Peninsula.

4. The main points for consideration are :—

(*a*) The number and size of pipe lines necessary.

(*b*) The position of the relay pumping station or stations.

(*c*) The capacity and type of the dredger employed.

5. The following are my views on the subject :—

(1) A project prepared by a firm of Contractors in 1912 proposed seven pipe lines across the peninsula but I am disposed to think such a large number are unnecessary and will add considerably to the difficulties and cost of the work as the pipe lines have to be laid underneath existing streets. I therefore propose three pipe lines, Nos. 6, 4, and 2 on the plan, with auxiliary lines laterally and outward as necessary.

(2) The length of the pipe line from dredger to relay pumping station should be the greatest that a dredger with one pump can work successfully and must not in any case be less than 5,000 feet; the sections accompanying this letter give the levels throughout the three pipe lines.

It is matter for consideration whether the relay pumping station should be established afloat on a barge or on the land but in either case it would probably be cheaper to drive the pump by electricity.

(3) The dredger must work to a depth of 70 feet and have a *minimum capacity of* 2,000 *cubic yards* of clay per hour discharged at the extreme end of the whole pipe line.

I consider the type of dredger most suitable would be that of the " Jinga " or " Kalu " with all recent improvements and modifications. Arrangements must be made to raise steam in the boiler by either oil or coal fuel and I shall be obliged by your opinion on the use of the Diesel or similar type of internal-combustion engine or alternatively driving the pump by electricity supplied from Bombay Central Station.

These were proposals of the contractors already alluded to but do not commend themselves to my judgment.

6. An estimate is required of the cost of the plant complete, delivered and erected at Bombay, and as in the case of the dredger " Pelican " you built to my order I shall be satisfied with a test in this country and your guarantee that the plant will do the work required. Time is of importance and I should like to know the earliest date delivery could be given from the placing of the order.

7. The Contractors offered to procure for Government the plant at " the special prices at which manufacturers supply plant and materials to contractors." I was not aware that a Government dealing direct were not in as good a position as contractors and shall be glad of your observation on this point.

8. The proposals I have outlined above are subject to modification if your experience can suggest improvement and I should like to meet you at Renfrew and discuss details personally at a later date when you are ready for me to do so.

I am,

Yours faithfully,

(Sgd.) GEO. C. BUCHANAN.

(IV.)

83, Victoria Street,
Westminster,
London, S.W.

9th October, 1926.

R. B. EWBANK, Esq., C.I.E.,
6, Richmond Terrace,
Whitehall, S.W.1.

Dear Sir,

I have to acknowledge the receipt of your letter of the 6th inst., and in reply would say I have had a careful search made and cannot find any written record that Sir George Buchanan asked Messrs. Simons to agree to a test of the dredger in Bombay.

With regard to the question of the capacity of the pumps on the " Sir George Lloyd " when delivering water, the capacity is approximately sixty thousand gallons per minute and will vary according to the condition of the pipe line, etc.

Yours faithfully,

(Sgd.) THOS. McMURRAY.

(V.)

Extract from letter of 23rd April, 1925, to the Chief Engineer, Reclamations Branch, Development Directorate.

Through the Director of Development.

* * * * * *

As it is not important that the finished bottom of the dredging should be level, the bottom 2 or 3 ft. of stiff clay with murum and boulders should, if possible, be avoided wherever met with as it is apparently unsuitable and uneconomical for the dredger to deal with.

* * * * * *

23rd July, 1925.

Sir LAWLESS HEPPER, Kt.
Director of Development,
Reclamations Branch,
Old Custom House Yard, Fort,
Bombay.

Dear Sir,

Back Bay Reclamation.

Further to our letter of 25th May last, we have had several conversations with the Deputy Chief Engineer Dredging (Mr. C. R. Brims) since his return to this country.

We gather that there is nothing wrong with the dredging plant and, therefore, no complaint can be made against the builders.

The opinion we have formed as a result of the conversations is that, as previously suggested by us, an incentive should be given to the men working the dredgers in the form of bonus on output and, further, that every effort should be made not to lose time working in hard material if softer is available in ample quantities as we consider increased speed of working more important than quality of material.

Yours faithfully,

C. S. MEIK & BUCHANAN.

15th October, 1925.

THE SECRETARY TO THE GOVERNMENT OF BOMBAY,

Development Department,
Bombay Castle,
Bombay.

SIR,

Bombay Back Bay Reclamation Scheme.

In continuation of our letter, dated 24th September, acknowledging receipt of your letter S.B. 1291, of 28th August, on the subject of dredging operations, Sir George Buchanan has returned to London and we have discussed the matter fully with him and Mr. MacMurray, the London representative of Messrs. Wm. Simons and Company, Limited, who were the builders of the dredging plant.

2. The following are some of the conclusions arrived at :—

(I) The dredger " Sir George Lloyd " was designed to dredge 2,000 cubic yards of soft clay and silt per hour and pump this quantity on shore through a pipe line 5,000 feet in length and there seems to be no reason for assuming that this work cannot be performed. All her tests on the Clyde were carried out to the complete satisfaction of the consulting naval architects, Messrs. Sir John H. Biles and Company, and, from the time that the vessel was taken over by the Government of Bombay, the builder's responsibility ceased.

(II) The builders are naturally for their own sakes anxious that the plant should prove a success, but they are not specialists in the handling and working of dredging plant and in the absence of any specific complaint about the machinery or any portion of same, it is not clear what good interest could be served by their representative going to Bombay. Nevertheless if it can be shown that a visit would be advantageous they are only too anxious to do what is possible in the matter.

(III) The lowness of the output of the " Sir George Lloyd " is in our considered opinion due to one of two causes, or probably a combination of the two :—

(*a*) Unsuitable material, and
(*b*) inefficient handling of the plant.

It is obvious that if the dredger is put to work in such hard material that the cutter blades are damaged, as we understand was the case last season, or if the dredger with booster is asked to deliver continuously through a length of pipe line largely in excess of 10,000 feet, the output must be greatly reduced. We are therefore of opinion (and so informed Mr. Brims when he was here) that when the dredger is found to be working in this hard material, the suction pipe should be lifted and operations continued in the softer clay overlying the rock.

Regarding the handling of the plant, we suggested in our letter, dated 25th May, 1925, that on work of this description it is of vital importance to give an incentive to the men employed ; we can only repeat and emphasise this statement and would observe that no contractor would for one moment have handled the job in the way in which it is being carried out in Bombay. In this connection we would invite a reference to paragraph 29 of Sir George Buchanan's report dated 11th February, 1922, which reads as follows :—

> " In carrying out a large public work departmentally success both economic and technical depends to a large extent upon the adequacy, efficiency and loyalty of the engineering staff, technically because apart from actual design much depends upon workmanship and economics because the spending of money and the employment to the best advantage of workmen is entirely in their hands.
>
> " Government is in regard to its staff at a disadvantage compared with a contractor or a private firm. The loyalty and enthusiasm of a staff is often taken for granted but it is rarely spontaneous and in the case of a contractor or private firm bonuses are given for particularly good work and in other ways officers are encouraged to do a great deal more than is strictly required of them, also on the converse side if an engineer is inefficient a contractor will cut his losses and get rid of a man by paying whatever is legally due in lieu of notice. Government rules precludes either bonuses or pay in lieu of notice and I merely mention this matter because it is one of the chief advantages gained in employing a contractor for the execution of public works."

(IV) If the difficulties in connection with (*a*) and (*b*) supra can be overcome we are absolutely confident that there will be an enormous increase in the output this season and in that case a final judgment on the ultimate cost of reclamation by dredging might we suggest be deferred.

3. According to the figures given in your letter under reply, 1,261,986 cubic yards of material was dredged from the harbour during the last season but only 680,438 cubic yards was deposited in Back Bay. The smallness of this latter figure obviously points to a great leakage from the area under reclamation and the advisability is indicated of tipping a watertight moorum bank along the inside face of the sea wall and otherwise arranging for the detention within the area under reclamation, of as much as possible of the silt-laden water discharged through the pipe line until the silt has precipitated. Under these circumstances, we disagree with the view taken that the quantity of filling as measured in the area to be reclaimed should be taken as the basis of calculating the output of the dredger. In all normal cases the quantity of filling is slightly greater than the quantity of material dredged as measured by soundings and, assuming that the chief engineer's figures given in your letter are correct, we consider that the loss of material in the reclaimed area is quite as serious a matter as the low rate of output of the dredger.

4. Respecting the quality of the material being dredged in the harbour, this is a question which, as you are aware, has been the subject of investigation, discussion and report by Sir George Buchanan ever since the inception of the work, because, as he has repeatedly stated in his reports, the crux of the whole undertaking is the successful reclamation of the area enclosed by the wall by pumping through pipe lines the material dredged from the sea bed, and in his last annual report, dated 15th December, 1924, he reviewed exhaustively the position in respect to dredging plant and dredging operations. It follows, therefore, that if as a result of this season's work it is found beyond doubt that there is not sufficient suitable material in the harbour for the economic reclamation of Back Bay by dredging it will be necessary to reconsider and modify the programme of operations although we sincerely hope that such will not be necessary.

5. In your letter you observe that Government undertook the reclamation on the recommendation of Sir George Buchanan contained in his report of September, 1919, the essential feature of the proposals being the capacity of the dredger to reclaim the area at the rate of 2,000 cubic yards per hour. In this connection we beg to repeat that we have no doubt at all as to the capacity of the dredger to perform the work given suitable material, and we would point out that in recommending the work Sir George Buchanan relied entirely on the detailed survey and report of Mr. Kidd, who said it had been completely established that there was available more than three times the quantity required of suitable material. On this data Sir George Buchanan remarked, *vide* paragraph 34 of his report, "on the assumption that Mr. Kidd's surveys and borings are correct, and I see no reason to doubt their accuracy as a great many borings were taken, I accept his conclusion both in respect to quality and quantity of material." Sir George Buchanan did not himself take any borings, nor in view of the urgency with which his report was required would there have been time to do so. We understand from Sir George Buchanan that Mr. Kidd's borings and estimate of quantities were also accepted as sufficiently accurate by the officials in the Public Works Department of the Government of India, when Sir George, at the request of His Excellency the Governor of Bombay, went to Delhi especially to discuss the project with the Government of India and obtain their sanction and approval to the technical details of the scheme.

6. With reference to the various letters and cables which have been exchanged between us with regard to the date of Sir George Buchanan's next visit to Bombay, we very much regret to inform you that he is at present in such a bad state of health that his doctor has stated emphatically that in his opinion it is extremely unlikely he will be able to travel to India without the most serious prejudice to his health before the autumn of 1926. We need hardly say that this is a matter of very serious concern to Sir George, who was relying on being able to fulfil his engagement, but ill-health is a matter which unfortunately cannot be guaranteed against.

7. In order to assist as much as possible your construction staff in solving the problems before them, we are sending the senior member of our staff, Mr. J. Risley Settle, M.Inst.C.E., to Bombay to enquire into matters and advise on the spot; he leaves London this week. We also hope to be able to arrange that Mr. Halcrow pays a short visit to Bombay early in January and we shall be glad to hear from you if the Government will accept these arrangements which are the best we can make, in lieu of the visit of Sir George Buchanan required by our agreement. Should Sir George's recovery be more rapid than expected he will, of course, go to Bombay instead of Mr. Halcrow.

Yours faithfully,

(Sgd.) C. S. MEIK & BUCHANAN.

(VI.)

Extract from letter, dated 24th July, 1924, from Chief Engineer to Messrs. Meik & Buchanan.

(Through the Director of Development.)

DEAR SIRS,

I have to acknowledge the receipt of your telegram, dated 23rd July, which translated reads as follows :—

" Anxious about dredging have you made arrangements regarding engagement of complete staff for working double shift on all dredgers."

In reply I confirm having wired you as per copy enclosed herewith.

I now enclose for your information copies of my letters to Government asking for arrangements to be made for the engagement of staff required to complete the stablishment to work dredgers double shift, together with a copy of the reminder sent on receipt of your telegram referred to above.

* * * * * *

Yours faithfully,

(Sgd.) H. A. ELGEE,

Chief Engineer.

Enclosure.

Extract from telegram, dated 24th July, from the Chief Engineer, Reclamation to Messrs. C. S. Meik & Buchanan.

Reference your telegram 23rd July have asked Government engage necessary staff, stop.

* * * * * *

Copy of letter, No. 2710, dated 24th July, 1924, from the Chief Engineer, Back Bay Reclamation Scheme, to the Secretary to Government, Development Department.

I forward herewith a copy of telegram received from Messrs. Meik & Buchanan for information.

" Anxious about dredging have you made arrangements regarding engagement of complete staff for working double shift on all dredgers."

I would refer to my Nos. 2432 of 30th June, 1924, 2672 of 22nd July, 1924, and 2673 of 22nd July, 1924, asking for arrangements to be made for the engagement of officers to complete the staff required and would again point out the urgency of immediate action being taken if the services of these men are to be obtained in time for the commencement of the dredging season.

Copy of letter, No. 2432, dated 30th June, 1924, from the Chief Engineer, Back Bay Reclamation Scheme, to the Secretary to Government, Development Department.

The undermentioned additional staff will be required for the dredging operations next season.

Grade.	*No. required.*	*Rate of pay.*
2nd Engineer	4	640-30-700
3rd Engineer	4	540-30-600
Assistant Dredging Masters ...	2	600-50-800

These appointments bring the numbers in the respective grades up to the establishment sanctioned in G.R. No. S.C. 1735, dated 26th November, 1923.

I should be glad if Messrs. Meik & Buchanan could be asked to recommend suitable men for these appointments. The High Commissioner should be asked to engage the men recommended if found fit for service on a four years' agreement on the usual terms.

It would be convenient if it could be arranged for one 2nd Engineer and one 3rd Engineer to arrive in Bombay by the 19th September and the remainder of the men by the 26th September.

(VII.)

Wash Borings made in Back Bay.

Statement produced by Sir G. Buchanan.

AREA " A "—February to April, 1922.

Point Number.	Total depth reached.	Depth at which nature of sea bed changes.	Details of strata.
	Ft. ins.	Ft. ins. Ft. ins.	
1	9 6	0 — 9 6	Sand and clay.
2	11 4	0 — 9 0	Sand and clay.
		9 0 — 11 4	Hard clay.
3	9 0	0 — 9 0	Soft clay.
4	16 6	0 — 8 0	Soft clay.
		8 0 — 16 6	Hard clay.
5	10 11	0 — 8 0	Sand and soft clay.
		8 0 — 9 6	Hard clay.
		9 6 — 10 11	Hard clay and small stone.
6	10 11	0 — 8 0	Sand and soft clay.
		8 0 — 10 0	Hard clay and stones.
7	10 10	0 — 8 10	Sand and soft clay.
		8 10 — 9 6	Hard clay.
		9 6 — 10 10	Hard clay and stones.
8	11 3	0 — 8 0	Sand and soft clay.
		8 0 — 11 3	Hard clay.
9	21 6	0 — 16 1	Sand and soft clay.
		16 1 — 21 6	Hard clay.
10	21 8	0 — 15 6	Sand and soft clay.
		15 6 — 21 8	Hard clay.
11	15 10	0 — 9 3	Sand and soft clay.
		9 3 — 15 10	Hard clay.
12	12 8	0 — 10 11	Sand and soft clay.
		10 11 — 12 8	Hard clay.
13	11 6	0 — 6 0	Soft clay.
		6 0 — 11 6	Hard clay and stones.
14	8 4	0 — 4 9	Sand and soft clay.
		4 9 — 8 4	Hard clay and stones.
15	19 1	0 — 15 3	Sand and soft clay.
		15 3 — 19 1	Hard clay.
16	16 1	0 — 11 0	Sand and soft clay.
		11 0 — 16 1	Hard clay.
17	13 4	0 — 8 4	Soft clay and stones.
		8 4 — 13 4	Hard clay and stones.
18	9 6	0 — 7 6	Sand and soft clay.
		7 6 — 9 6	Hard clay.
19	9 8	0 — 5 6	Sand and soft clay.
		5 6 — 9 8	Hard clay and stones.
21	7 9	0 — 5 0	Sand and soft clay.
		5 0 — 7 9	Hard clay.
23	9 1	0 — 6 0	Sand and soft clay.
		6 0 — 9 1	Hard clay and stones.
25	10 3	0 — 5 9	Sand and soft clay.
		5 9 — 10 3	Hard clay.
27	6 7	0 — 4 3	Sand and soft clay.
		4 3 — 6 7	Hard clay.
29	4 10	0 — 3 0	Sand and soft clay.
		3 0 — 4 10	Hard clay and stones.
31	4 11	0 — 3 6	Soft clay.
		3 6 — 4 11	Hard clay and stones.
33	6 11	0 — 3 0	Soft clay.
		3 0 — 6 11	Hard clay and stones.
37	4 3	0 — 1 9	Sand and soft clay.
		1 9 — 4 3	Hard clay and stones.
39	6 7	0 — 3 0	Sand and soft clay.
		3 0 — 6 7	Hard clay and stones.
41	4 11	0 — 2 10	Sand and soft clay.
		2 10 — 4 11	Hard clay and stones.
43	16 1	0 — 10 0	Sand and soft clay.
		10 0 — 16 1	Hard clay and stones.
45	2 0	0 — 2 0	Hard clay and stones.
47	3 6	0 — 1 0	Soft clay.
		1 0 — 3 6	Hard clay and stones.
49	9 7	0 — 5 0	Sand and soft clay.
		5 0 — 9 7	Hard clay and stones.
51	6 6	0 — 2 0	Soft clay.
		2 0 — 6 6	Hard clay and stones.
53	Nil	Rocky	—
55	Nil	Rocky	—
57	2 8	0 — 1 0	Soft clay.
		1 0 — 2 8	Hard clay and stones.
59	Nil	Rocky	—
61	Nil	Rocky	—
63	7 3	0 — 4 0	Soft clay.
		4 0 — 7 3	Hard clay and stones.

NOTE :—The strata referred to as sand and soft clay varies from a mixture of sand and silt on the surface to a blue clay with sand which hardens on exposure.

The hard clay varies from brown to red in colour and is washed up in lumps with small edged stones (not pebbles) embedded and appears to resemble what in the dry state forms the murram in the hills around Bombay.

Beneath this there appears to be a similar soil but with larger stones not removable by wash boring.

Borings carried out during week ending Wednesday, 7th February, 1923.

AREA " A "—Point 41.

Total depth of bore 14 feet 6 inches.

0 in.— 6 in.—hard yellow clay and small stones.
6 in.— 2 ft. 6 in.—black sand.
2 ft. 6 in.—11 ft. 0 in.—sand and clay.
11 ft. 0 in.—14 ft. 6 in.—rock.

AREA " B "—Record of borings with Calyx drill.

Point Number.	Total depth reached.	——	Remarks as to nature of material found.
	Ft. ins.	Ft. ins. Ft. ins.	
34	18 6	0 — 5 0	Sand stone.
		5 0 — 7 0	Hard yellow clay with stones.
		7 0 — 17 6	Soft red clay.
		17 6 — 18 6	Hard rock.
5	17·0	0 — 2 0	Sand stone.
		2 0 — 14 0	Soft clay.
		14 0 — 17 0	Rock.

(VIII.)

Design and Alleged Porous Nature of Rubble Mound.—Note by Sir George Buchanan.

The wall was properly designed, with small material, *i.e.*, the run of the quarry in the middle, and large stones outside, and properly constructed, the wall should have blinded itself, because the silt-laden water would have filled up the small interstices and made the wall watertight.

Naturally above the filling, tidal water will flow through the wall.

If the wall was not built to plan and specification it was the fault of the engineers on the job, and particularly Mr. Elgee, who was in charge of the Marine Lines section, and Mr. Billington, at Colaba.

On my inspection I frequently pointed out that we did not want all big stones in the middle, and that what was required was the run of the quarry.

When dredging started the material was particularly good, and so far as I could see very little was being lost through the wall, and on the occasion when I was asked if certain blinding was required I pointed out I would rather have the material elsewhere, but I distinctly remember on several occasions pointing out to Mr. Billington and Mr. Lewis and, I think, to Mr. Brims; but of that I cannot be certain, that if material was escaping anywhere it was down the large storm-water drain and that this should be closed. When at a later date it was apparent to the engineers on the spot who were looking at the work all day that large quantities of material were escaping through the wall, it was their obvious duty to take action. I understand Mr. Brims, the superintendent of dredging, asked repeatedly that this should be done, but Mr. Elgee refused, and our engineer, Mr. Settle, when in Bombay in December, 1924, reported to us that even at that date no proper action had been taken.

Letter dated 24th January, 1924, from Chief Engineer to Sir G. Buchanan. (Through the Director of Development.)

DEAR SIR,

IN a discussion in Sir Lawless Hepper's room a few days ago it was suggested that the rubble mound should be lined on the inside with a layer of quarry spoil to prevent any leakage of dredged material. Would you agree to have this spoil placed in position from the present time onwards? If this can be done the disorganisation of the quarries due to the curtailment of programme will be mitigated and use can be made of a by-product which otherwise has to be found room for with some difficulty and at some expense.

I propose a thickness of 3 feet of spoil.

Yours faithfully,

(Sgd.) LL. W. LEWIS,
Chief Engineer.

Letter dated the 28th January, 1924, from Sir George Buchanan, K.C.I.E., to the Chief Engineer, Reclamation Branch.

(Through the Director of Development.)

DEAR SIR,

No. 371.

Reference your letter dated 24th January, 1924.

I AM not in favour of beginning at present the lining of the rubble mound on the inside with quarry spoil. I believe that later on when the reclamation towards the wall is more advanced, it may be desirable to put a lining on the inside up to H.W. Neap Tides only, but any small stuff deposited now would I am afraid be dispersed and washed away. In the matter of making immediate use of your quarry spoil, I consider a great deal could be utilised in the reclamation of the area between the old foreshore line and the railway embankment (*vide* my letter dated 21st January).

Cross Bunds.—With reference to my decision to delete the cross bunds from the programme, it seems to me that as the dredger "Kalu" will not work in Back Bay this season, work might very well be suspended on the cross bund now in course of erection at Marine Lines. The only object to my knowledge in making this bund was to facilitate dredging operations in the absence of the storm-water drain, but by next season when dredging begins the storm-water drain will be finished. There is, I believe, some 5,000 tons of stone still to be deposited to finish the work, so that a saving could be effected by stopping the work of, say, 30,000 rupees.

Yours faithfully,

GEO. C. BUCHANAN.

(IX.)

Alleged Inadequacy of Dredging Plant.—Statement by Sir George Buchanan, K.C.I.E., Dated 18th November, 1926.

With reference to Sir Frederick Hopkinson's question asking me how, with the plant available, I proposed to reach with the pipe lines the extreme points in the reclamation area, my explanation is as follows:—

Plans Numbers 3067 and 3068 (copies appended hereto*) were sent to the builders with full particulars of the work to be done, and they were asked, on these plans and particulars, to submit an estimate for dredging plant suitable for the work.

In the first instance, as explained to the Committee, and in accordance with the usual practice of Consulting Engineers, an estimate was obtained from Messrs. Wm. Simons & Co., Ltd. They had designed the "Jinga" and "Kalu" for work in Bombay Harbour in material similar to that for which the Back Bay dredger was required; they had also designed the dredgers for the Burma Government, used in the Twante Canal, which had worked most successfully under my supervision in Mesopotamia—and I approached them feeling that I should get a practical proposition.

Messrs. Simons & Co., submitted a tender for a dredger capable of discharging at the rate of 2,000 cubic yards of soft clay per hour through a floating pipe line to a distance of 5,000 feet; an intermediate stage pumping station capable also of delivering to a distance of 5,000 feet; 5,000 feet of floating discharge pipe, and 8,500 feet of shore piping, this latter being sufficient to cover the whole area. It was realised by me that the total distance that the material would have to be conveyed exceeded, in some cases, 10,000 feet. This aspect of the case was discussed by me with Messrs. Simons & Co., and it was agreed that an auxiliary shore booster, estimated by the firm to cost three lakhs of rupees, might be necessary, but that consideration as to its purchase might be deferred until work had actually been put in hand. It will be noted that on p. 30 of my project report of 1919, the three lakhs provision is indicated clearly in the difference in cost between the dredger and one shore delivery, and the same dredger and two shore deliveries.

It must be borne in mind that it is unnecessary for the pipe line to extend to the extreme points of the areas to be reclaimed as the water-borne material spreads for a considerable distance in front of the pipes.

It was expected to complete the Colaba area without the additional land booster, by extending the pipe line for a few hundred feet. Such extension would not have affected the output appreciably; any falling off in deliveries would have been compensated for by increased outputs through lengths of less than 5,000 feet.

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* Not reproduced.

The Marine Lines area contains 2½ million cubic yards beyond the actual 5,000 foot radius, and whether the reclaiming of this area justified the purchase of an additional shore booster was, as I have already stated, a matter that might be well left over for future consideration, and in my report I had pointed out that by increasing the number of intermediate pumping stations there would be no difficulty in discharging any distance.

The estimate for the dredger, one booster and 13,500 feet of pipe line, plus working expenses, came to 5.90 annas per cubic yard, whilst in the general estimate 8 annas was allowed to provide for contingencies of this nature.

Tenders from other firms for dredging plant were taken in February 1920, by my partner the late Mr. C. S. Meik during my absence in India.

Messrs. Simons & Co's. tender, including 10 per cent. for extension of time to March 1920, amounted to £496,650 against the tender submitted by Messrs. Lobnitz & Co. for £840,000. It is correct that Messrs. Lobnitz & Co's. tender included 19,000 feet of pipes as against Messrs. Simons & Co's. 13,500 feet and two dredgers as against Messrs. Simons & Co's. one dredger and an intermediate pumping station on a pontoon, but Mr. Meik probably weighed the extras contained in Messrs. Lobnitz' tender against the cost, and formed the opinion that the proposals of Messrs. Simons & Co., were sufficient for carrying out the work. Hence his cablegram to me in Bombay.

(X.)

Dates of Sir G. Buchanan's visits to Bombay. Put in by himself.

1919 :
Arrived Bombay, 19th May.
Left Bombay, 31st May.
Arrived Bombay, 15th November.

1920 :
Arrived Bombay, 15th November.
Left Bombay for Burma, 18th December.

1921 :
Arrived Bombay, 9th January, from Burma.
Left Bombay for London, 19th February.
Left London for Bombay, 17th November.
Arrived Bombay, 3rd December.
Left for Baroda, 9th December (evening).
Arrived Bombay, 11th December (morning).

1922 :
Left for Kutch, 9th January.
Arrived Bombay from Kutch, 20th January.
Sailed for London, 25th February.
Arrived Bombay, 4th December.
Went to Calcutta for Christmas holiday, 22nd December.

1923 :
Arrived Bombay, 1st January.
Left Bombay for London, 20th January.
Arrived Bombay, 13th July.
At Mussoni, 15th to 21st July.
Went to Baroda, 28th July (evening).
Arrived Bombay, 30th July.
Left Bombay for London, 11th August.
Arrived Bombay, 28th December.

1924 :
Left for Baroda, 5th January (night).
Arrived Bombay, 8th January.
Left for Dwarka, 12th January.
At Bombay, 17th January.
Left Bombay for London, 16th February.
Arrived Bombay, 24th October.
Went to Dwarka, 15th November.
Arrived Bombay, 20th November.
Left for Nagpur for Christmas holidays, 23rd December.

1925 :
Left Bombay for Australia, 7th January.

(XI.)

Letter dated 14th February, 1921, from Sir G. Buchanan to the Director of Development.

MY DEAR HEPPER,

I send herewith the draft programme of operations which completes the various items I said I would dispose of before leaving for England.

Yours sincerely,
(Sgd.) GEORGE BUCHANAN.

Enclosure.

BACK BAY RECLAMATION SCHEME, BOMBAY.

Programme of Operations.

We are now in a position to summarise what has been done in the preliminary stages and to formulate a programme for the immediate future.

Tenders have been received from contractors for the building of a concrete block wall 8,000 feet long at Colaba, but as no tender was satisfactory from either the economic or technical point of view and the best source of supply of stone is undoubtedly the Government quarries now being opened out at Kandivlee, it has been decided to revert to the original design, for a rubble wall with the exception of the first 2,000 feet, and to carry out the work departmentally. The first 2,000 feet will be of concrete in mass as originally intended.

On the assumption that actual wall construction at both ends will begin early in October, the following works will have to be executed before that date.

Quarries.

The greater part of the machinery has been ordered and will be coming forward within the next few months. Work to be put in hand comprises erection of machinery, workshops and power house, construction of quarters for staff and workmen, laying of railway sidings and connection with the B.B. & C.I. main line, opening out working face at quarries and general organisation of operations to ensure an output of 800 tons per diem. The latter figure constitutes a large quarry and entails a highly efficient organisation.

Chowpatti and Marine Lines.

Between these two points will be situated the main depot and works construction yard. The first and most urgent work is the connection with the B.B. & C.I. Railway at Chowpatti and the laying out of the yard sidings which will require to be sufficient to deal with stone trains for Marine Lines and for Colaba respectively and also general traffic in connection with the works.

There will be considerable work in connection with erection of machinery, store sheds, cement sheds, staff and workmen's quarters, etc., and general preparations for construction.

Colaba.

It is intended to utilise the stone from the reef for the 2,000 feet of mass concrete wall and it will be necessary to erect stone crushers, concrete mixers, cranes, collect sand and cement, make arrangements for shuttering and provide accommodation for staff and workmen. A light railway will also be required from the mixers to and along the wall. It is hoped to build the 2,000 feet of wall in one working season and meanwhile the through railway line along the foreshore and foreshore road to connect with the line from Chowpatti will be put in hand and must be ready for the working season 1922-23.

Permanent Works.

It is confidently hoped to begin work at both ends on the 1st October, 1921, on the following lines :—

Marine Lines.—The sequence of operations will be as follows :

(1) Drive gantry piles and construct gantry.

(1A) Lay apron of large stones on 2 feet of small 20 feet wide, at the toe of the wall on the sea side.

(2) Tip rubble stone from wagons on gantry.

(3) Build on rubble mound, mass concrete superstructure.

Once the work is in full swing, we shall aim at advancing at the rate of 30 feet per diem and to complete 3,000 lineal feet in the season, but that entails driving 8 to 10 gantry piles a day and handling and fixing 375 cubic feet of timber, depositing 16,000 cubic feet of stone rubble and placing 142 cubic yards of concrete in the wall.

These figures are given to show that the task is by no means a light one.

Colaba.—We shall be well satisfied if the 2,000 feet of mass concrete wall is finished in the season of 1921-1922 and arrangements will be made to proceed in 1922-23 exactly as specified above for Marine Lines.

Dredger and Pipe Lines.—The dredger under present arrangements will probably arrive about October, 1922, but meanwhile there is an immense amount of work to do in laying the three pipe lines across the peninsula. The longest and most difficult line is that which runs from the Harbour down Ormiston Street through the Y.M.C.A. Grounds under the B.B. & C.I. Railway to the north of the Baths and thence along the ride to a point between Church Gate Street and Marine Lines Station. This work can probably be let by contract for a portion of its length. The other two pipe lines present no difficulty.

The dredger will probably begin operations at Colaba Point, discharging through pipe line No. 1, and I hope that some 200,000 square yards will be reclaimed in the working season 1922-23.

Other work.—A work which is not urgent but must be arranged for is the prolonging of the storm water drains from the present sea-front to outside the new wall.

It should be noted that the programme outlined above does not include the East Colaba Reclamation, and if this is to be taken in hand in the near future by the Back Bay staff, and we are to be entrusted with the working arrangements and supervision we should like to receive instructions as soon as convenient in order that we may arrange for the work to proceed without in any way interfering with the progress of the Back Bay Scheme.

(Sgd.) GEO. C. BUCHANAN.
15th February, 1921.

Letter dated 12th May, 1922, from Director of Development to Sir G. Buchanan.

My Dear Buchanan,

Your letters of 11th and 27th April. Lewis was in hospital for several weeks and has not been at all fit since he came out. In his present condition, he is not up to the job. He will go before a medical board before leaving and will, of course, have to be passed fit by the medical board at the India Office before he returns.

2. I went through the question about rolling stock, etc., with Lewis, and the result was the telegram he sent you. With the exception of the portal crane for Colaba, it seemed to me to be advisable to order the plant. Your remarks regarding the construction of the rubble mound at Colaba raised a question as to whether it would not be safer at Marine Lines to defer building the mass concrete wall until the rubble mound had had one monsoon to test it. Your reply to this is indefinite, but I do not think it wise to order the cement. We can probably get it later at the same price if necessary.

3. I several times suggested to Lewis that in view of the fact that no heavy protection blocks can be placed at Marine Lines before the monsoon, it might be better to defer the mass concrete wall at Marine Lines till next cold weather. My idea was that any weak points in the mound could be made good during the monsoon and no real damage could be done. On the other hand, serious subsidence or distortion of the mass concrete might be disastrous. I use the word from the political more than the engineering point of view. Criticism has died down but the critics and pessimists are there, and I am most anxious that no excuse should be given for a renewal of the agitation. Lewis, however, argued that the cement would go bad if not used, and in any case, both he and Elgee made light of my apprehensions and the work of constructing the mass concrete wall is feverishly proceeding. I hope they are right.

4. The stone tipped between the piles does not form much of a slope as the material seems to be jammed by the wood work. They are now tipping big stones on the outer face, and, although in my view, it still looks far from safe, I am hoping that the monsoon will be late and that it will be possible to make a good slope on the outer face of big stones before the attack begins. I do not like risks being run because as indicated in the preceding paragraph, I do not think we can afford them.

5. I am sorry the matter of reporting the arrival of the " Sir George Lloyd " and " Colaba " was overlooked. A telegram is being sent to-day.

6. The remarks about accounts, and also about additional engineering staff, in your report, were referred to Lewis immediately, and he was asked to consider them and to submit any recommendations he had to make. So far, he has produced nothing but he promises to let me hear before he leaves. In any case, as Mr. Reith wants the same pay as Elgee, I doubt if he can be employed.

7. After endless delays, the railway to Colaba has been begun and I hope that under a different regime it may be possible to get it finished by October. The progress at Colaba is disappointing, but I think Billinton has done wonders considering the few facilities he has, and the cramped nature of the situation. I attach for your information, copy of a note I recently sent to Lewis about the programme for next year.

8. As a result of your recommendation not to build the mass concrete wall at Colaba till year after next, Lewis now talks of beginning pumping in October, 1924! However, we can discuss that next cold weather.

I am not leaving Bombay until 8th July.

Yours sincerely,

(Sgd.) L. HEPPER.

Enclosure.

In view of your approaching departure on leave it is, I think, desirable that definite proposals for the programme of work to be carried out on the reclamation next season should be put on record.

2. So far, our energies have been directed mainly to the Marine Lines part of the work and at the commencement, in the absence of information as to the proposed layout, there was no particular reason for any special preference being given as between Marine Lines and Colaba.

3. Mr. Davidge's preliminary layout plan has, however, now been accepted in the main and it is evident, looking at the reclamation as a commercial proposition, that it is the portion of the reclamation from Colaba northwards as far as Mayo Road that is of the first importance, a view which receives further support from the agreement we have come to, to sell 265 acres at the southern extremity of the reclamation to the Military Department in an undeveloped state.

4. It is in fact now apparent that, in order to begin to realise money by sales to the Military and the public as early as possible, we must concentrate on Colaba and reclaim from the south by sections, the sections being conveniently formed by bunds following the main roads running at right angles to the sea wall.

5. Our progress to date, however, has been greatest at the Marine Lines end of the work, where 2,000 feet of wall has been constructed behind which we are not likely to do any filling for 6 or 8 years. The main question is whether we can continue the wall at Marine Lines next season without limiting the length of wall which we might otherwise construct at Colaba. If, by closing down Marine Lines next year, we can thereby do more at Colaba then there is, I think, a strong argument for adopting that course.

6. It is, I take it, mainly a question of the supply of stone which is definitely limited by our transport facilities, and I am anxious that the Colaba work should be treated as of the first importance, Marine Lines being looked on as secondary only, and that the former should not suffer by any mistaken desire for rapid progress at Marine Lines which to a certain extent amounts to putting our money in the wrong place at the present stage.

7. The reclamation behind the first 6,000 ft. of wall from Marine Lines will bring us no return, and economically speaking should have been left to the last. We cannot help that now, but we can adjust our future programme to enable us to start filling at the earliest possible date, areas which are to be sold. Subject to engineering requirements being met, it is obviously desirable, having regard to interest charges, to restrict expenditure, in the beginning to work which will be directly remunerative.

8. I shall be glad if you will consider the matter in the light of these remarks and let me have before you leave, your recommendations as to the programme for next year.

Deputy Director (to see)

Chief Engineer,
Reclamation Branch,

Letter dated 3rd June 1922, from Messrs. Meik & Buchanan to the Chief Engineer, Reclamation Department.

Reclamation Department,
Directorate of Development.

DEAR SIR,

We desire to address you on the subject of the relationship between yourself as the Resident Engineer, nominated by us for carrying out the Back Bay Reclamation Scheme, and ourselves as the Engineers of the Secretary of State in carrying out the scheme because we feel that we are not being kept in sufficient touch with the work or supplied with the information necessary for the due performance of the duties specified in our agreement with the Secretary of State. This has not always been the case, as last year after Sir George Buchanan's annual visit, we were kept fully informed by Mr. Lewis as to what was going on, and in addition to official letters he wrote a demi-official letter to Sir George Buchanan nearly every mail. This year, however, a veil appears to have dropped between us and since Sir George Buchanan left Bombay on the 25th February, we have practically had no news of any kind as to the progress of the works for which we are the Engineers, responsible to the Government of Bombay and the Secretary of State.

2. We beg to remind you that before leaving Bombay, at the end of February, Sir George Buchanan writing on our behalf as per copy enclosed, requested that we should be furnished with a monthly report and expenditure statement, and on the 12th April, we wrote from this office sending forms of progress report to be filled up. To neither of these letters have we received an acknowledgment.

3. In Sir George Buchanan's report to the Director dated 11th February 1922, and subsequently endorsed by us, a number of questions were raised which the Director in his letter dated 15th March, said would be taken up with you. We are anxious to know what action has been taken on each of the points raised by Sir George Buchanan, and in particular on the proposals contained in para. 41 of his report for concentrating on the following works :—

(1) Railway connection between Colaba and Marine Lines.

(2) Preparation of terminal arrangements at Colaba and purchase of end tipping wagons.

(3) On completion of Numbers 1 and 2, construction of stone mound to a distance of 10,000 feet from Colaba and cross bunds as required.

(4) Erection of dredger's floating pipe line and laying of the land pipe line for the dredger to serve that area.

4. In para. 27 of the report, Sir George Buchanan said it was impossible to fix a date for starting the dredger and that had it not been for the delays in beginning the work last season, he was of opinion that wall construction should have advanced sufficiently to make it worth while beginning dredging operations at the end of this year and that this possibility should still be kept in view, one pipe line being laid across the peninsula in order to be ready for eventualities.

The above proposals have our entire concurrence. We think a great effort should be made to advance the Colaba work sufficiently to do some dredging before the advent of the 1923 monsoon, and we cannot accept the views expressed by Mr. Lewis to the effect that no dredging should be attempted until the sea wall was complete up to the top. We adhere to our opinion that it would be quite practicable and indeed desirable to begin reclamation in the Colaba area so soon as the rubble mound had been deposited up to high water mark and we do not attach any importance to Mr. Lewis's fear that the areas under reclamation would be liable to be flooded by any tide higher than 86·25 because in any case the sea must pass through the porous rubble wall for a long time to come.

5. Other points on which information is desired are as follows :—

(*a*) On the 4th April, we wrote asking for a detailed report showing the points, raised by the Chief Inspector of Boilers, Bombay, for all boilers despatched, in order that we might take the matter up with the manufacturers in this country. We received an acknowledgment to this request in your letter dated 21st April 1922, but up to the present the report asked for has not been received.

(*b*) On the 24th November, we wrote to you with reference to the Ingersoll Rand contract, a portion of which was supplied from America, and we asked to hear whether the whole of the items embraced in the contract had been safely received. We are being pressed by the India Office for a reply to this question in order that they may close their files on the subject.

(*c*) We have not as yet received a copy of the Project Estimate which has presumably been submitted to Government, nor have we received the current Budget Estimate of Expenditure for the year 1922-23. We have not even been informed of the arrival of the dredger " Sir George Lloyd " or of the auxiliary dredger " Colaba "; the condition in which they were delivered or where they have been placed.

(*d*) In Sir George Buchanan's letter dated 22nd January to your address, he asked to be furnished with some information as to the quality of the Portland cement being used and we shall be glad to have a reply to that letter and some records of cement tests.

(*e*) When the works were started it was Mr. Lewis's expressed intention to obtain a complete photographic record of the progress of the works, and to that end three photographic cameras, complete with accessories and chemicals, etc., were purchased by Mr. Lewis at a cost of £234. One of these cameras is in use at the quarry where some valuable records have been taken but we have seen no photographs of the works at Marine Lines or Colaba.

(*f*) We are very anxious about the expenditure on the works and if Sir George Buchanan's recommendations have been carried out, you should by this time have a proper cost accounting staff without which it will be quite impossible to exercise economy and have a check on expenditure.

(*g*) We have heard unofficially, that Mr. Lewis has been a considerable time in hospital, and further that he was expected to take leave some time in May but we have no knowledge officially of any change.

6. Finally, we would say that we fully appreciate the difficulties you are encountering in carrying out departmentally a work of such magnitude and we should be the last people to contemplate adding to those difficulties.

We know that in the matter of details in connection with the execution of the works you are taking the place of the contractor and as far as possible the man on the spot must be allowed to use his unfettered discretion. That need not, however, prevent your keeping us fully informed as to the progress and cost of the works, and asking us to advise on all matters where you think you should be benefited thereby, because it is impossible to ignore that fact that under our agreement with the Secretary of State we are appointed the Engineers in carrying out the scheme and in the construction and execution of all works connected therewith until their final completion, and we are specifically instructed to assist and advise the Government of Bombay in all matters relating to the execution of the works and to perform all works and duties devolving upon Engineers of large works.

We are, dear Sir,

Yours faithfully,

(Signed) C. S. MEIK & BUCHANAN.

Letter dated 8th June 1922, from Sir G. Buchanan to the Director of Development.

(Confidential.)

MY DEAR HEPPER,

Since writing to you on the 3rd June, I have received your confidential letter of the 12th May.

With reference to the building of the mass concrete wall on the rubble mound at Marine Lines we have always been adverse to the proposal as we considered the rubble mound should have at least one monsoon to settle down. I argued the point at length with Lewis when I was in Bombay, and when he pointed out that if we adhered to our views it would wreck his programme of work for the season and that he proposed to finish a length of wall complete with the protection blocks on the outside, I rather reluctantly gave way.

On the 2nd March, before my arrival home, Mr. Meik wrote to Lewis as follows :—

" If you adhere to your intention of building the concrete wall or blocks on the rubble within a month or two after the rubble is deposited, you are certain to have a considerable settlement, perhaps a foot or more. In this case, the proposal, as on sketch No. 332, would be the best as the space intervening between the blocks will allow any irregularities in the front face of the wall to be made up better, but the cost would be rather higher than either of the other proposals."

On the 4th May we received a cablegram from Lewis in reply to a letter from us dated 11th April saying, amongst other things, and with reference to paragraph 6 in our letter—

> " . . . mass concrete wall is now under construction Marine Lines as originally arranged for and recognised in your report of 11th February, but heavy protection blocks cannot be placed before monsoon as portal cranes only now arriving full stop. As supplies cement for next year have to be arranged by end of May do you definitely recommend next season work Marine Lines should consist of 3,000 feet gantry and rubble mound only."

Paragraph 6 in our letter was with reference to Colaba only, and Mr. Meik and I were seriously concerned with the statement that heavy protection blocks at Marine Lines could not be placed before monsoon, but as at that date the monsoon was only two or three weeks off we gathered most of the work was finished and that it was, therefore, useless to make a protest. Further, as even in the monsoon there are a number of hours every day when the crane could work, we supposed that the outside protection blocks would be placed before there was any likelihood of much damage and we trust that this has been done.

Your letter amply confirms the fears I have already expressed in my letter of the 3rd June, and there is not the slightest doubt that a drastic change is necessary in administration and execution of the works, and if Lewis, either through illness or other cause, is unable or unwilling to carry out our instructions it will be better for every one if he does not return.

In the matter of dredging, it seems to me that for some reasons of his own, Lewis has made up his mind to delay operations as long as possible and to begin reclamation at Marine Lines instead of at Colaba. I am very disappointed indeed to hear from you that the railway to Colaba is only just begun because so far as I am aware there was nothing to prevent it being by this time very nearly finished.

Yours sincerely,

(Signed) GEO. C. BUCHANAN.

SIR LAWLESS HEPPER,
Directorate of Development,
Old Custom House Yard,
Bombay.

(XII.)

Note by Sir George Buchanan regarding the estimate on page 29 of the Report of 1919.

My estimate dated 1919 contains all the necessary information to enable any responsible person to form an opinion as to its reliability. It contains very much more detail than Mr. Kidd's estimate, although Mr. Kidd's was supposed to be a working estimate whilst mine was in point of fact the usual preliminary engineering estimate which an engineer makes to his client. It was accompanied by no working drawings and was not supposed to contain details.

Mr. Kidd, on the other hand, is supposed to have prepared and submitted a complete detailed working project, which was accompanied by 10 sheets of drawings. It was handed to me as such for examination and report. The Government of Bombay in sending this scheme to the Government of India had observed

> " the drawings might be considered as complete working drawings which would give sufficient information for examination of the design and for the immediate commencement of the work. All doubtful points had been settled and the revised estimate might be accepted as completely trustworthy and ample."

I repeat that Mr. Kidd's estimate was devoid of detail whilst mine was full of detail in comparison with the estimate of Mr. Kidd.

It is not usual for an engineer to explain in any greater detail than I have done how my estimate was prepared.

It contained at page 13 a comparison of Mr. Kidd's estimate of cost with my estimate of cost for 1912, and under Table B my estimate cost in 1919.

It also contained at page 29 the detailed estimate of the cost of the scheme on my lines, *i.e.*, number of cubic yards of concrete, rubble, concrete blocks, moorum filling, etc., etc., with prices affixed against each.

I will now describe how I arrived at my estimate to Mr. Kidd's scheme 1912.

In the first place it was necessary to take out a complete schedule of quantities for Mr. Kidd's scheme and although Mr. Kidd had given no such schedule in his report we were enabled to do so by taking Mr. Kidd's drawings and from them get out *de novo* the whole of the quantities contained therein. This we did and after putting our rates under each item we arrived at a total of 170·94 lakhs. To this we added Mr. Kidd's item of 59·45 lakhs for roads, lights, and drains, and engineers' and contractors' commission 11·51 lakhs.—Total 241·90 lakhs, against Mr. Kidd's 325·23 lakhs, and we came to the conclusion that Mr. Kidd had over-estimated the work to the extent of 83·33 lakhs.

We then went on to our own estimate and dealt with it in a similar way. We took out the whole of the quantities from information in our office and fixed what we considered were the correct rates and we arrived at a total of 367·71 lakhs.

Our estimate was based on an increase of 2½ times over 1912.

The information I obtained from Bombay and brought home with me is as follows :—

List of prices of work done on the Kennedy sea face in 1912-13 and 1919-20, obtained from Mr. Johnson, Executive Engineer Presidency, in charge of the Kennedy sea face works.

Letter from Mr. Messent, the chief engineer of the Port Trust, dated 30th May, 1919, with a list of prices in Bombay, for various classes of work in 1914 and 1919.

Rate for moorum filling, Improvement Trust Scheme, 1919.

Letter from Mr. Trench, Assistant Secretary to Government, P.W.D., Bombay, containing cost of rubble and cost of stone at Port Trust Quarries.

Note of Mr. Trench, Assistant Secretary, P.W.D., concerning cost of Kennedy sea face wall.

Note giving price of timber by Mr. Pearson.

Cross section of the Mazagon Sewri Reclamation wall, supplied by Mr. Messent, with note of the cost of concrete blocks, 1917 and 1919.

The above information, along with the many records in our office of the cost of works of all kinds enabled us to put prices to our schedule of quantities.

Note put in by Sir George Buchanan on 12th November.

Back Bay Reclamation Scheme—Note on Estimated Cost of Dredging.

In estimating dredging costs two factors must be considered, capital cost of plant per unit and working cost per unit. The capital cost naturally varies according to the quantity dredged, the greater the quantity the less being the capital cost.

In two dredging propositions of say 10 million cubic yards and 5 million cubic yards respectively executed by similar dredgers the capital cost per unit of the large scheme would be less than that for the smaller scheme, if the total cost of the plant was debited against each scheme.

Working expenses, however, are fairly uniform and comparisons can be made with different works.

In my 1919 report and estimate I calculated that capital cost of plant would be 3.24 annas per cubic yard and working expenses 2.66 annas—total 5.90 annas, but in my estimate I allowed 8 annas per cubic yard, an increase of 2.1 annas, or on the total the sum of Rs.32,81,250, say £218,000, whilst dividing 2.09 annas equally between capital and working expenses, we have capital cost 4.39 per cubic yard, working expenses 3.61 per cubic yard.

It has been freely stated that my estimate of 8 annas was too low because Mr. Kidd's tender, made in 1912, was 9 annas 3 pies per cubic yard.

I again assert most positively that my estimate was a reasonable one and that Mr. Kidd's was excessive.

Mr. Kidd gave no details in his tender but in the course of his evidence before the Committee said his dredging plant was estimated to cost in 1912 £287,625, which converted to rupees at 15 and divided by 24,162,463 comes to 2.86 annas per cubic yard. I consider his price for plant in 1912 high, but assuming that amount is allowed there is left for working expenses 6.39 annas against my figure in 1919 of 3.61.

The easiest way to see which figure is correct is to take reliable figures of cost of dredging executed elsewhere about that time and I will therefore quote figures in my possession which I used to check my estimate.

Twante Canal, Burma.—This project was the nearest in approach to the Bombay Scheme.

Three suction cutter pipe line dredgers were used, the material was clay and silt, and the total working expenses for the 6 months ending 30th June, 1915, was annas 1.83 per cubic yard and for the previous 6 months 1.88 annas per cubic yard, and from the beginning of the work in 1912 the dredgers had excavated 10,420,000 cubic yards, the total working expenses being 2.01 per cubic yard.

To take some more examples from my records—

Dredger "Pelican."—The suction pump dredger "Pelican" working in Rangoon in 1912 and 1913 in sand and silt, moved two million tons at a total cost for working expenses of 1.90 annas per cubic yard.

The Suction Dredger "Bolari."—This is a large suction hopper dredger working on the Hooghly and an analysis of her work in 1914 gave total working expenses of 8.40 pies per cubic yard.

The Suction Cutter Pipe Line Dredger "Foyers."—Working in Bengal in 1914 moved 3,200,000 cubic yards at a total working cost of 10 pies per cubic yard and working from 1908 to 1915 moved 14,230,000 cubic yards at a total working cost of 1.16 annas per cubic yard.

These examples from actual work done are, I think, sufficient and surely with these figures before me I was justified in thinking Mr. Kidd's estimate of 7.12 annas most excessive and my estimate of 3.71 annas ample—the difference between Mr. Kidd and myself on the whole 25 million cubic yards being Rs.53,22,000 or over £350,000.

I have no information in detail as to the cost of dredging in Bombay on the Back Bay Scheme and am perfectly satisfied that with proper organisation and continual working enormous economies can be effected.

(XIII.)

Letter dated 31st July from Sir George Buchanan to Lord Lloyd.

DEAR SIR GEORGE,

I began a letter to Your Excellency some time ago but decided, as Sir Lawless Hepper was on his way home, to wait until I had seen him as I know you have quite sufficient worries without my adding to them.

At our last meeting in Bombay I told Your Excellency that there seemed to be some misapprehension as to our position, that Mr. Lewis appeared to be regarded as the chief engineer in fact as well as in name and that at the meeting of the Advisory Committee I was not even introduced to the members.

After my return home we were very much concerned at the absolute cessation of all letters and reports from Mr. Lewis, and on the 3rd June, 1922, I wrote a strong letter of remonstrance and sent a copy to Sir Lawless Hepper. Since then, and I think principally because Mr. Lewis has gone on leave, the veil has been lifted and we are getting our reports by nearly every mail.

Sir Lawless Hepper called here on the 26th instant, and I showed him a letter, of which I enclose a copy, the original having been despatched. The letter speaks for itself, the gist of it being that we should like to do our job according to our reading of the agreement, but Mr. Lewis, either through ill-health or a misconception of our position has been keeping us in the dark and treating us as consultants.

Sir Lawless Hepper now takes our view and the matter will have to be cleared up if and when Mr. Lewis returns to duty.

I am leaving for South Africa next week to report on a very large harbour scheme for the Government of the Union of South Africa but it will not interfere with my usual visit to Bombay, and as Your Excellency will see from our letter we wish to send out ahead of me a particularly experienced member of our staff to collect information and be ready to assist me on my arrival.

I have written this letter because I know how very interested Your Excellency is in everything connected with the Back Bay Scheme, and believe you will like to hear of any difficulties direct from me.

Yours sincerely,
(Sgd.) GEO. C. BUCHANAN.

HIS EXCELLENCY SIR GEORGE LLOYD, G.C.I.E., D.S.O.,
Governor of Bombay.

Enclosure.

26th July, 1922.

To, THE DIRECTOR OF DEVELOPMENT.

DEAR SIR,

We have the honour to acknowledge receipt of your letter No. D.B. 164, dated 4th July, 1922, forwarding project estimates for the Back Bay and East Colaba Reclamation Schemes, on which we beg to make the following observations.

Back Bay Scheme.

The estimate accompanying Sir George Buchanan's 1918 report amounted to lakhs 367.61 which was increased by Government to four crores. In June, 1921, Mr. Lewis, the Chief Engineer; Reclamation Branch, prepared a revised estimate amounting to lakhs 703.17 which was only submitted to us demi-officially, and we could therefore only express demi-officially our disagreement with the figures and our surprise that the estimate should have been prepared without our knowledge.

In 1922, Sir George Buchanan, after a very complete investigation, made a report dated 11th February, 1922, accompanied by a revised estimate amounting to a nett cost of lakhs 598.89. This estimate was prepared as far as possible in consultation with the Chief Engineer, Reclamation Branch, and from actual costs of the work at the time, but it was understood that in order to conform to the rules of the Government of India in the Public Works Department, what is known as a detailed project estimate would be required which was to be prepared in the office of the Chief Engineer, Reclamation Branch. The total nett amount of this project estimate is lakhs 697.79, or lakhs 98.90 over and above Sir George Buchanan's estimate and the accompanying sheet shows the comparison under the various heads. The chief difference is under roads, lights, and drains. The original pre-War estimate was 75 lakhs which Sir George Buchanan increased to 135 lakhs. Mr. Lewis has gone into the matter in more detail and estimates, roughly, the cost at 211.91. This figure is an enormous one and cannot be accepted without careful examination and a great deal more information.

Another matter that attracts our attention is the estimate of 18.70 lakhs over and above Sir George Buchanan's estimate for the sea wall on rubble mound, and we notice that the Chief Engineer, Reclamation Branch, has allowed 9,811 hundred cubic feet of concrete more than Sir George Buchanan and 161½ tons of steel reinforcement which was not included in our design.

We most respectfully suggest that having regard to the difference in the project estimate and the revised estimate Sir George Buchanan prepared last February, it would have been reasonable if the Chief Engineer, Reclamation Branch, had furnished us with a copy of his estimate and allowed us to make our comments on the same before its submission to your Government.

We are afraid that there exists a misapprehension as to the relationship between the Chief Engineer and ourselves or it may be that we have misinterpreted our agreement with the Secretary of State in which case we shall gladly conform to your reading of the terms. According to the memorandum of agreement we agreed to act as the engineers to the Secretary of State in carrying out the said scheme and in the construction and execution of all works connected therewith until their final completion. We were at all times to assist and advise the Government of Bombay in all matters relating to the execution of the works and were to supervise the same and undertake all works and duties devolving upon engineers of large works. The agreement further provided that a Resident Engineer and a Deputy Resident Engineer should be nominated by us to carry out the details of the work in accordance with our instructions, subject to the control of the Director of Development or other official appointed by the Government of Bombay.

We understand that the Resident Engineer has had his title changed to Chief Engineer, Reclamation Branch, because there would probably be other works than the Back Bay Scheme to perform, but the change of title does not presumably affect his relationship to ourselves, and on every point connected with the design of the work we expect instructions to be taken from us. The Chief Engineer, Reclamation Branch, has, however, in his project estimate report, called us the Consulting Engineers in which case he, as the Chief Engineer, would only consult us when he felt disposed so to do.

Another point on which we desire guidance is the amount of supervision and control expected from us in connection with the execution of the works as apart from the design. The work being done departmentally, the Chief Engineer takes the part of the contractor and if a contract had been let for a fixed sum we should not have interfered with the contractor's discretion in the matter of plant or details of construction unless we thought the ultimate completion of the work would be affected. On the other hand, if the contract had been let on a time and line basis we should have considered it to be our duty to scrutinise all arrangements and all expenditure.

We interpret our agreement to mean that we are the actual responsible engineers, that we are designing all the works and that whilst in the various details for carrying out the work a fairly wide discretion should be left to the Chief Engineer, we must be kept in continual touch with all that is going on and allowed to express our views, and if necessary criticise the Chief Engineer's actions. If our interpretations meet with the approval of Government we suggest that it should be made clear by you to the Chief Engineer, Reclamation Branch, and an end thus put to a misunderstanding which must give rise to friction and will certainly interfere with the successful and efficient carrying out of the work.

We may add that we have under consideration to send out at the end of the monsoon the Senior Engineer on our staff, a gentleman with great experience in the practical carrying out of work to make a thorough investigation on our behalf and gather together information to be placed before Sir George Buchanan on his arrival at Bombay, but this can only be done if we have the willing co-operation of the Chief Engineer, Reclamation Branch, who, if he wishes to do so, can make not only our assistant's visit but Sir George Buchanan's visit fruitless.

East Colaba Scheme.

We note that Government have not appointed us Engineers for this project and trust that this is not a final decision as we see our way to making considerable saving on the project estimate. We would also point out that the two schemes are so closely allied as to really form one work, especially as construction will be proceeding on both at the same time; the same plant is to be used, the same source of supply, along with the same engineering and supervising staff; questions will constantly arise equally affecting both schemes and it will be almost impossible for the engineers of the one scheme to be unconnected with the other.

We may add that we are quite willing to meet your Government in the question of fees which do not concern us so much as the difficulties we see before us if we do not control, for engineering purposes, the construction of both projects.

We are, dear Sir,
Yours faithfully,

(Sgd.) C. S. MEIK & BUCHANAN.

(XIV.)

List of Drawings of Works prepared by Messrs. C. S. Meik and Buchanan in London and sent to Bombay.

COLABA SECTION (CONTRACT).

Drawing No.	*Date.*	*Description.*
*	Dec. 1920.	Specification.
3164	18.11.20.	Plan with contours showing position of wall.
3165	18.11.20.	Section on line of sea wall, South Colaba.
3166	18.11.20.	Cross-sections of ground to be reclaimed.
3167	18.11.20.	Three sections of wall—details of parapet, coping, tidal flaps, etc.
3168	18.11.20.	Longitudinal and cross-section of rubble cross bank.
3314	12.1.22.	Plan and sections of proposed arrangement for transferring stone,
3315	12.1.22.	from side to end tip wagons.
3321	2.2.22.	Proposed arrangement for tipping—Colaba wall—showing concrete pier and steel girders.
3322	2.2.22.	Proposed arrangement for tipping—Colaba wall—showing rubble mound.
3323	2.3.22.	Proposed arrangement for tipping—Colaba wall—showing elevations.

NORTH SECTION—MARINE LINES.

*	16.11.20.	Specification.
3169	18.11.20.	Enlarged plan of blockyard.
3170	18.11.20.	Cross-section of cross-wall in moorum.
3180	18.11.20.	General plan with contours showing line of wall.
3181	18.11.20.	Longitudinal section on line of wall.
3182	18.11.20.	Three cross-sections of wall on rubble bank.
3183	18.11.20.	Two sections showing crane road and timber gantry also temporary work.
3184	18.11.20.	Plan and sections of pipe lines (3) through Peninsula. (3 No. drawings.)
3185	18.11.20.	Plan section and elevation of timber moulds for blocks.
3186	18.11.20.	Plan section and elevation of reinforced concrete blocks.
3187	18.11.20.	Borings in harbour, copies from L.K. & Co.'s plan.
3188	18.11.20.	Sections 19, 20 and 21, copies from L.K. & Co.'s plan.
3189	18.11.20.	Plan showing blockyard, works, sidings, etc.
3243	14.4.21.	Plan showing alternative position of pipe line No. 3.

Drawing No.	*Date.*	*Description.*
3244	26.4.21.	400 ft. plan of Bombay showing scheme of operations with dredging and filling quantities thereon.
3257	23.6.21.	Plan of Back Bay showing rock outcrop, soundings and line of wall.
3259	24.6.21.	Section of wall with detail of parapet as amended.
3330	2.3.22.	Construction of sea wall.
3331	2.3.22.	Construction of sea wall—first alternative proposal.
3332	2.3.22.	Construction of sea wall—second alternative proposal.
3409	20.4.23.	Plan showing storm water drains.
3414	20.4.23.	Cross-section of proposed blockwork drain.
3415	20.4.23.	Average cross-section of No. 7 drain.
3411	4.5.23.	Plan of proposed programme for commencement of dredging.
3431	21.6.23.	Cross-section of Marine Drive showing levels.
3411	27.7.23.	Plan of proposed programme for commencement of dredging.
3428	27.7.23.	Borings in Back Bay.
3437	1.8.23.	Plan of Back Bay showing position of levels required.
3463	8.11.23.	Plan showing proposed programme of work to complete wall and dredging.
3466	8.11.23.	Plan showing position of cables in Back Bay.
3470	13.12.23.	Part elevation of parapet wall.
3471	13.12.23.	Details of parapet.
3472	13.12.23.	Proposed pier in Back Bay.
3456	13.12.23.	Proposed steps in sea wall.
3459	13.12.23.	Proposed steps in sea wall and pilaster.
3474	4.1.24.	Plan of Back Bay giving dimensions for lay-out of roads.
3475	4.1.24.	Plan of Back Bay showing position of cables.
3496	8.5.24.	Plan of dredging in Back Bay.
3610	12.2.25.	Reference plan to fix position of dredger in progress reports.

EAST COLABA RECLAMATION.

	23.10.23.	Specification.
3454	20.9.23.	Plan showing proposed position of New Military Pier.
3460	30.10.23.	Plan showing sea wall and sections of wall.
3461	30.10.23.	Details of drains and coping.
3616	19.3.25.	Cross-section of mound and wall, showing proposed reduction in width.
3435	27.6.23.	Proposed lay-out, plan and section.

GENERAL.

Numerous other drawings in connection with the ordering of plant not included in the above.

(XV.)

Extract from Sir George Buchanan's Diary.

8th February, 1921.

Meeting with Hepper at 11 a.m. to discuss the tenders for the Colaba contract. Lewis present and all agreed it should be departmental.

(XVI.)

The question of the single stage pump on the "Sir George Lloyd."—Statement by Sir George Buchanan.

Sir Frederick Hopkinson asks why a single stage pump was used at Bombay whereas at Rangoon there was a double stage pump.

There was not a double stage pump at Rangoon. There were two pumps.

Why the "Sir George Lloyd" had a single stage pump instead of a double stage pump is a question which should be addressed to the Builders and to Sir John Biles, the Naval Architect.

(XVII.)

Supply of 20-ton crane.—Letter of 16th November, 1920, from Mr. C. S. Meik to Sir G. Buchanan.

DEAR BUCHANAN,

Bombay Back Bay Reclamation Scheme.—Cranes.

As no doubt Lewis has told you, he has now got the orders placed for practically the whole of the machinery, including the cranes.

In the matter of the cranes, I have been into the whole question with Lewis and we have come to the conclusion that it would be better to defer ordering the cranes to deal with the concrete blocks until it is ascertained whether or not we are going to get really sufficiently large stone from the quarry to protect the sea face. I enclose you a memo. that Lewis has handed me in this connection and with which I cordially agree. There is no doubt that if we can get stone of large enough size from the quarry it will mean the saving of a great deal of money.

* * * * * *

* * * * * *

Yours truly,
(Sgd.) C. S. MEIK.

Enclosure.

16, Victoria Street,
Westminster, S.W.1.
15th November, 1920.

Messrs. Ransomes & Rapier, Ltd.,
32, Victoria Street,
Westminster, S.W.1.

DEAR SIRS,

With reference to your letter, No. 11,671, of 12th November, 1920, I am recommending the Director-General of Stores, India Office, the acceptance of your tender for—

		£
Item 1.	5-ton crane at	3,500
Item 2.	Seven No. 7-ton cranes at £2,850 each	19,950
Item 8.	One 20-ton Portal Steam Crane, max. radius 50 ft., 12 ft. 6 in. gauge track	10,450
		£33,900

all packed for shipment overseas and delivered f.o.b. London.

You will receive formal contract from the Director-General of Stores, India Office. Inspection will be arranged for by Messrs. C. S. Meik & Buchanan on hearing from you of the completion of the cranes.

Yours truly,
(Sgd.) LL. W. LEWIS.

(XVIII.)

Correspondence regarding bonus to dredging staff.

26th February, 1925.

(Through the Director of Development.)

THE CHIEF ENGINEER,
Reclamations Branch,
Development Directorate,
Old Custom House Yard,
Bombay, India.

DEAR SIR,

Bombay Back Bay Reclamation Scheme.

Dredging.

We regret to note from your weekly dredging reports that the output of the " Sir George Lloyd " continues so low, the average hourly output to the date of your last

report, 6th February, gives only 43 per cent. of the designed capacity of the dredger. You have no doubt been able to form a definite opinion as to the cause or causes of the low output and we shall be glad therefore if you will let us have all information on the matter so that we can consider it before taking up the matter with the builders.

The builders' specification states "The dredger is to be capable, under ordinary working conditions, of excavating 2,000 cubic yards per hour of soft clay from depths up to 70 feet below water level and delivering the spoil through a floating steel pipe line 5,000 feet long to an intermediate pumping station."

And of the "intermediate pumping station" the specification states "The dredging pump is to be capable, under ordinary working conditions, of discharging 2,000 cubic yards per hour of soft clay through a pipe line 5,000 feet long to a height of 16 feet above water level."

The two main factors therefore to be considered as affecting the question of output are :—

(*a*) The actual working conditions, and whether they are such as may reasonably be considered to be covered by "under ordinary working conditions" of the specification.

(*b*) The working lengths and height of the discharge pipe.

With regard to (*b*) the total length of pipe line has not, since the resumption of dredging operations this season, according to the weekly reports, exceeded 9,768 feet—the total length for week ended 8th January should be 8,943 feet. Except during week ending 1st January, when the output reached 1,133 cubic yards per hour the length of the pipe line between the dredger and "Colaba" has exceeded 5,000 feet.

The maximum output during this season of 1,222 cubic yards was obtained during week ended 18th December, 1924, when the length of pipe line between the crafts was 5,389 feet, or 389 feet longer than the specified length, though the total length of the line was only 9,271 feet.

The minimum output of 613 cubic yards, except week ended 11th December, 1924, occurred during week ended 6th February, 1925, when the lengths of the pipe line were 5,781 feet and 3,987 feet, or a total length of under 10,000 feet.

These facts are better realised by comparing them as follows :—

Week ended.	Length of Pipe.			Average hourly output for week.	Pumping time percentage of total working time.
	Dredger to Intermediate Pumping Station.	Intermediate Pumping Station to end of pipe line.	Total.		
	L. ft.	L. ft.	L. ft.	C. yds.	
December 18th, 1924	5,389	3,882	9,271	1,222	67·71
January 1st, 1925	4,821	3,882	8,703	1,133	57·78
January 29th, 1925	5,701	3,957	9,658	799	65·87
February 6th, 1925	5,781	3,987	9,768	613	71 37

Assuming that the conditions of working, except the lengths of the pipe line, and the weekly methods of measurements, during the period under review were similar, it is difficult to account not only for the low hourly output but also for the wide weekly variations in the output.

We note the actual pumping time is 67 per cent of the total time worked.

As the output of the dredger and auxiliary craft so largely depends upon the dredging staff, you have no doubt arranged to pay bonus on the output and we shall be obliged if you will let us have a copy of the bonus conditions, also particulars of the method of measurements adopted as the basis of payment and for weekly progress.

We should also like to have a weekly progress return for the "Kalu" similar to that for the "Sir George Lloyd."

The areas in which it is proposed to dredge on the harbour side are shown on a plan which accompanied Sir George Buchanan's report of the 15th December, 1924, Areas K and G appear to have been abandoned and we shall be glad to hear from you the reasons for this alteration from the original scheme.

Yours truly,

for C. S. Meik & Buchanan.

(Sgd.) W. T. HALCROW.

No. 854.

Development Directorate,
Back Bay Reclamation Scheme,
Chief Engineer's Office,
Old Custom House Yard, Fort,
Bombay.

MESSRS. C. S. MEIK & BUCHANAN,
16, Victoria Street, Westminster,
London, S.W.1.

20th March, 1925.

DEAR SIRS,

Reference your letter of the 26th February, 1925.

The principal reasons for the low output of the " Sir George Lloyd " are as follows :—

1. Inexperienced Assistant Dredging Masters.
2. Nature of material dredged.
3. Strong ebb tides.
4. Bad holding ground for anchors.

The influence of the above on the output of the dredger is as follows :—

1.—(*a*) The working of a suction cutter dredger is entirely different from the working of a bucket ladder dredger, owing to the fact that with the latter the individual in charge of the dredging operations can see exactly how much material he is getting in each bucket, whereas with a suction cutter dredger it is quite impossible for him to do so and the only means by which it is possible to tell whether the dredger is getting plenty of material or not is by the vacuum in the suction pipe, as recorded on the vacuum indicator, and also the pressure on the pump as indicated on the pressure gauge. These two indications in themselves are by no means definite evidence that the dredger is getting a fair quantity of material. This can only be told after years of experience and in my opinion it takes 10 years at least to train a man to work a suction cutter dredger satisfactorily even if he is intelligent and takes an interest in his work. I am afraid that at least one of the Assistant Dredger Masters on the " Sir George Lloyd " does not come under this category. If the Assistant Dredging Master is not experienced at this class of work he does not keep the dredger up to her face or else he does not work the cuts systematically.

(*b*) The Dredging Master, Mr. Speirs, was working this dredger last season and the output was very much better than it has been this season in spite of the fact that we did not have the same depth of material last season that we have had this season. Owing to Mr. Speirs having to look after the working of the " Kalu " in Back Bay this season, it has been impossible for him to devote his whole time to the training of the men on the " Sir George Lloyd." On various occasions when he has returned on board the " Sir George Lloyd " this season, he has found that the cuts have not been worked systematically, making it necessary to pull the dredger astern and clean up the high ridges left, which were preventing the suction frame from getting down to the full depth.

2.—(*a*) The material dredged this season has been approximately as follows :—

The top layer of material which has varied from 8 to 15 feet in depth has been fine silt. The underlying material which has varied from 7 feet to 20 feet has been clay or consolidated silt of a clay nature, the bottom 2 or 3 feet of which has been very stiff and interspersed with pinnacles of murum in which the boulders are embedded. Owing to the hard nature of this murum in which the boulders are embedded, the cutter engine is brought up all standing, or the cutter rides over the top and lifts the suction frame up. This naturally lowers the output of the dredger as it is impossible to keep the cutter into the material.

(*b*) The Builders' specification states 2,000 cubic yards per hour of soft clay, but I do not consider the material now being dredged could be classed as soft clay, and I am not prepared to say that the dredger is incapable of pumping 2,000 cubic yards per hour of *soft clay* under ordinary working conditions.

3. During spring tides the ebb is exceptionally strong and runs at times well over 4 knots an hour. This current on the long length of line which it is necessary to have, viz., 5,000 feet to 6,000 feet throws a tremendous strain on the moorings of the pipe line causing the anchors to drag and in turn throwing the weight of the pipe line on to the dredger with the result that it is impossible to keep the latter up to the working face. This has been on occasions so bad that it has been necessary to cease pumping operations for one to two hours over the height of the tide. Even when the dredger has not stopped work on account of the strong tide, she has been pumping a greater percentage of water than necessary owing to the impossibility of keeping the cutter into the face.

4. The greater portion of the sea bed south of the dredging area outside Oyster Rock is composed of loose shingle and stones or a thin layer of mud overlaying rock. This, as is well known, is extremely bad holding ground for anchors. This difficulty was foreseen last dredging season, and each pontoon was provided with two winches and anchors, although the original arrangement allowed for was for every fourth or fifth pontoon only to be provided with winches and anchors. The additional anchors provided were the same as those supplied with the pontoon, viz., 7 cwts., but owing to the difficulty experienced at the commencement of the dredging season in keeping the pipe line in position, six 30-cwt. anchors were obtained and laid out in addition to the 7-cwt. anchors. Even these have proved to be insufficient, and arrangements are now being made for the purchase of about nine more anchors of about 20 cwts.

I do not consider that the length of discharge line has in any way affected the output of the dredger. The maximum length of discharge line between the dredger and the booster pump this season has been 5,781 ft. The dredger is supposed to be capable of discharging 2,000 cubic yards per hour through 5,000 ft. of pipe line. When it is taken into consideration that the booster pump is introduced into the line 781 ft. beyond this distance and will suck the material out of the pipe, I think it will be agreed that the discharge line has not been too long between these two vessels. The total length of the discharge line from the booster pump has not yet reached the supposed maximum length of 5,000 ft. The total length of this line at the end of the last week was only 4,247 ft., in which length there is a difference in height of about 22 ft. at dead low water ordinary spring tides, or about 6 ft. at H.W.O.S.T. This, in my opinion, has had no material effect on the output of the dredger.

No bonus on the output has been arranged for this season owing to the fact that only one of the Assistant Dredging Masters has had any previous training, and I consider it would be throwing money away to fix a bonus at a low rate of output at this stage of the operations to enable the men to earn any bonus.

With regard to a weekly progress return for the " Kalu," as this vessel is only able to work for an hour or two a day every other week and her output is very small, being only about 225 cubic yards per hour owing to the hard nature of the clay under-lying the sand, it is not worth while giving any detailed report similar to that for the " Sir George Lloyd."

With regard to areas K. and G. referred to in the last paragraph of your letter, these have not necessarily been abandoned. During the visit of Sir George Buchanan and Mr. McMurray of Messrs. Simons & Co. in season 1923-24, it was remarked that the dredger ought not to have been started work dredging the material at the nearest point to discharge it at the nearest point on shore, but should have been started to work at the farthest out point of the dredging area to discharge at the nearest point on shore. But work was commenced in this area in accordance with your plan No. 3411, which was handed to Mr. Brims, and which shows the dredger " Sir George Lloyd " to commence dredging in the S.E. corner of area " K." But on investigation it was found impossible to put the dredger to work in the position shown owing to the presence of rock or boulders projecting up above the surface. Moreover, the depth of material available proved to be only about 4 or 5 ft., the majority of this being silt, and it would not have been economical working to attempt to dredge in this position.

It was impossible to commence work this season at the most distant point of the dredging area owing to insufficient floating pipe. This deficiency will not be made up until the pipe now on order from Messrs. Braithwaite & Co. is delivered.

Yours faithfully,

(Sgd.) H. A. ELGEE,

Chief Engineer.

(Through the Director of Development.)

23rd April, 1925.

(Through the Director of Development.)

THE CHIEF ENGINEER,

Reclamations Branch,
Development Directorate,
Old Custom House Yard,
Fort, Bombay,
India.

DEAR SIR,

We are obliged for your letter, No. 854, dated 20th March, 1925, relative to the low output of Suction Dredger *Sir George Lloyd*, and after carefully considering the

reasons therein given for the low output of the dredger, we desire to offer the following remarks and suggestions in the hope that they may help in overcoming the adverse conditions under which the work is being carried out and so improve the output.

The paragraphs are numbered to correspond with those of your letter.

1.- (*a*) The vacuum and pressure gauges connected with the suction pipe and pump, respectively, are aids specially provided for the guidance of the dredging master during dredging operations, and they are to an experienced dredging master, who has made himself generally acquainted with the material being dredged, an almost infallible guide as to the percentage of solid material being dredged and discharged. Particularly is this the case when dredging is in fairly uniform strata, though of varying depths, after a few simultaneous observations have been taken from time to time of the vacuum and pressure gauge readings and of the velocity of and the percentage of solids in the discharge at the end of the discharge pipe. The velocity is generally obtained by measuring the curve of discharge at the end of the pipe, and where this cannot be done by a pitot tube, which can be made on the works from $\frac{1}{2}$-inch or $\frac{3}{4}$-inch diameter piping. The percentage of solids is obtained by taking samples of the discharge at the end of the pipe.

The following observations have been found from previous experience to be generally correct.

The percentage of solids transported in a pipe-line decreases as the length of the pipe-line increases.

Material is transported in a pipe-line most efficiently at a velocity of about 12 feet per second.

The pressure is considerably greater when pumping sand and gravel than when pumping clay and loam, and the velocity of discharge is greater in the case of the latter.

The velocity of discharge decreases as the percentage of solids increases, but the increase in the percentage of solids more than compensates for the smaller discharge due to decreased velocity.

The vacuum always gives a higher reading, varying with the percentage of solids, than that obtained when pumping clear water.

When dredging and transporting a mixture of sand, shells, gravel, mud and stiff clay, the velocity of discharge in a pipe 2,000 feet long was found to vary from eight to 17 feet per second; and during these fluctuations the velocity decreased as the percentage of solids and the pressure, as indicated by the pressure gauge, increased.

A wide and continued variation in the vacuum also occurred when pumping solids, due apparently to the variations in the mixture of the materials.

The vacuum head in feet of water varied from 6 to 19.

Men experienced in handling suction dredgers are not easy to find, but we consider an intelligent man, seaman or engineer, with suitable Board of Trade certificates and of reasonably long sea service should very quickly learn to work the dredger efficiently, particularly under the general guidance of an experienced master like Mr. Spiers.

1. (*b*) The remarks clearly indicate that the assistant dredging master referred to was lacking in experience when compared with Mr. Spiers, but we hope his ability has improved and that he gives promise of efficient service.

2. (*a*) The material and the depths, averaging since week ended 18th December last from 20 feet to 30 feet, are considered to be ideal for suction cutter pump dredging and the very low output obtained is consequently very disappointing.

As it is not important that the finished bottom of the dredging should be level, the bottom two or three feet of stiff clay with murum and boulders should, if possible, be avoided wherever met with as it is apparently unsuitable and uneconomical for the dredger to deal with.

3. Where holding ground is bad it is a very common practice in dredging operations to back up an anchor which is gradually being brought " home " with another, usually single fluke anchor, the chain of which is payed out taut after making the end fast to the anchor to be backed up by the mooring lighter or anchor boat being towed by a launch in the direction in which the anchor is to be laid. The chain of the backing anchor should be of sufficient length to serve as a ground chain and to make sure that it will be taut when laid, it should be payed out under control of the lighter or anchor boat's crew.

When the ground is exceptionally bad, two backing anchors are laid out making an angle of about 20 degrees to 30 degrees with each other, at their connection with the anchor to be backed up.

As the output or efficiency of a suction dredger rapidly falls off after the designed length of discharge pipe is exceeded we are of opinion that the extra 781 feet of pipe between the dredger and the " Colaba " seriously affects the output and the better results would be obtained by exceeding the builder's limit of 5,000 feet as little as practicable.

We note that the difference in height of the discharge from the " Colaba " is about 22 feet at dead L.W.O.S.T., but as the builder's specification gives the height 16 feet, it is probable the 22 feet will not exceed the 16 feet limit which is measured from the centre of the pump to the centre (maximum level) of the discharge pipe.

If builder's limits are exceeded it is difficult to discuss question of output with them.

As a bonus on the output has not been arranged, we consider it should be arranged even at this late period of the season so as to give the men concerned the assurance that their better effort and skill in working the craft will be rewarded. We are strongly of opinion that the best output will not be obtained until a bonus is given and we therefore suggest that a start should be made at once with a reasonably substantial bonus to the dredging master (Mr. Spiers) and downwards. It is best to fix the bonus-earning limit low with a correspondingly low rate per unit and in this case might commence at 1,200 cubic yards per hour actual pumping or even a lower figure. The members of the crew concerned should at the same time be given to understand that the dredger and " Colaba " are capable of dredging clay and transporting it to reclamation at the rate of 2,000 cubic yards per hour.

It is an advantage to clear the discharge pipes during the operation of lifting the suction pipe and cutter at the close of the day's operation.

With regard to the " Kalu " there are several points on which we are not clear and we do not propose to write further on this matter until we have had an opportunity of seeing Mr. Brims.

Yours truly,

for C. S. MEIK & BUCHANAN,

(Sgd.) J. RISLEY SETTLE.

23rd July, 1925.

(Through the Director of Development.)

THE CHIEF ENGINEER,

Reclamations Branch,
Development Directorate,
Old Custom House Yard, Fort,
Bombay.

DEAR SIR,

Back Bay Reclamation.

Further to the correspondence *re* output of the *Sir George Lloyd* last season, we have had long conversations with Mr. Brims and have formed the opinion that the main causes of low output are the lack of incentive to the men in the form of a bonus on output, and also that there would appear to have been too much time spent on obtaining hard material at the expense of output, which we consider of greater importance.

We do not agree with the view stated on page 4, para. 2, of your letter 854 of 30th March last, that it is advisable to wait until the output is increased before fixing a bonus scale. We are of opinion that this should be done at the commencement of operations, the scale being based on the designed capacity of the craft, substantial bonus being earned when this is attained.

Yours truly,

(Signed) C. S. MEIK AND BUCHANAN.

No. 2349.

Development Directorate,
Back Bay Reclamation Scheme,
Chief Engineer's Office,
Old Custom House Yard, Fort, Bombay.
8th August, 1925.

MESSRS. C. S. MEIK & BUCHANAN,

16, Victoria Street, Westminster,
London, S.W.1.

DEAR SIRS,

In reply to yours of 23rd July, 1925, we are in agreement that a bonus will probably lead to an increase in the output, but I do not agree that the lack of this incentive is one

of the main causes of the low output, nor, do I agree that too much time has been spent on obtaining hard material by the *Sir George Lloyd* as all the material we can get from the area available will be required unless earth filling is resorted to.

I shall be glad to have your proposals of what bonus you would suggest, the scale being based on the designed capacity as mentioned in the last paragraph of your letter.

My idea is that a monthly bonus should be paid on *actual pumping time* only, exclusive of time spent in pumping water only, provided that measurements show that the quantity pumped is not less than say 900 cubic yards per hour.

The ordinary actual pumping time is reckoned to be 88 hours per week, when working double shifts.

Bonus to be paid, on the actual pumping time in excess of 80 hours per week in the following proportions :—

Sir George Lloyd & Colaba.	*Shares.*
4 Nos. 3rd Engineers at 1 share	4
4 ,, 2nd Engineers at $1\frac{1}{4}$ shares	5
2 ,, Chief Engineers at $1\frac{1}{2}$ shares	3
2 ,, Assistant Dredging Masters at $1\frac{1}{2}$ shares	3
1 ,, Dredging Master 2 shares	2
Total shares	17

If the bonus is fixed at, say, Rs.102 per hour, then the value of one share, Rs.102/17 = Rs.6, and the amount of bonus payable will be distributed as follows :—

	Bonus per hour.	
	Rs.	Rs.
4 3rd Engineers at	6.0.0	24.0.0
4 2nd ,, at	7.8.0	30.0.0
2 Chief Engineers at	9.0.0	18.0.0
2 Assistant Dredging Masters at	9.0.0	18.0.0
1 Dredging Master at	12.0.0	12.0.0
		Rs.102.0.0

Taking the output at 900 cubic yards per hour the output for 88 hours would be
$88 \times 900 = 79{,}200$ cubic yards.

Bonus on 8 hours at Rs.102 per hour = Rs.816.

$$\therefore \frac{816 \times 16 \times 12}{79{,}200} = 1{\cdot}98 \text{ pies per cubic yard additional cost.}$$

Yours faithfully,

H. A. ELGEE.
Chief Engineer.

Through the Director of Development.

16th September, 1925.

(Through the Director of Development.)

THE CHIEF ENGINEER,
Reclamations Branch, Development Directorate,
Old Custom House Yard,
Fort, Bombay, India.

DEAR SIR,

Back Bay Reclamation Scheme.—Dredging.

We duly received your No. 2349 of the 8-10th August, 1925, with regard to the proposed bonus to be paid on the output of the dredgers.

We note your suggestion that bonus should be paid on the *actual pumping time* and have given it our careful consideration. The idea is new to us and while we realise that a bonus on this basis would make for an increase in the number of hours' pumping (with reservations regarding the quantity of material pumped) we are of opinion that better results would be obtained by adopting the more usual system of bonus on the *actual quantity of material dredged per hour.*

We suggest that you should arrange a bonus based on a minimum figure of 800 to 1,000 cubic yards of material dredged per hour, as measured by soundings, for the " Sir George Lloyd," the actual amount depending to some extent on the nature of the material to be dredged. When the dredger is raising 2,000 cubic yards per hour the bonus to amount to 50 per cent. of the wages earned without bonus and between the minimum figure and 2,000 cubic yards a graduated scale to be prepared. All employees from the dredging superintendent downwards who can in any way influence the output to be put on the bonus list.

Assuming that the total wages bill is the same for an output of 1,000 or 2,000 cubic yards per hour, the cost of wages per cubic yard if and when the latter figure is reached would be 25 per cent. less, and fuel, stores and overhead charges would be reduced in greater proportion.

We suggest that you give this proposal your careful consideration.

Yours truly,

(Signed) C. S. MEIK & BUCHANAN.

(XIX.)

Letter dated 13th April, 1922, from Messrs. Meik & Buchanan to Director of Development.

SIR,

We have now had an opportunity of discussing with Sir George Buchanan the progress of the reclamation works at Back Bay, and we have also read his report to you, dated 17th February.

Whilst concurring generally with the report, we particularly desire to endorse and emphasise the paragraphs concerning engineering staff and engineering accounts; it is impossible to carry out efficiently a large public work without adequate engineering staff, and it is equally impossible to exercise economy without a proper system of cost accounting.

We also agree with Sir George Buchanan's programme of future operations and the suggestion for concentration contained in the latter portion of para. 41 of his report.

We had certainly hoped that the dredger would begin operations at the Colaba end during the next fair weather season, and we still think such a possibility should be kept in view.

The end tipping wagons will be despatched at the earliest possible date and if the railway between Marine Lines and Colaba is completed, and the cross wall built, even by hand labour, and the pipe line laid across the peninsula it might be possible, by beginning work at the end of August or early in September, to complete up to high water mark sufficient of the rubble mound, beyond the 2,000 feet of mass concrete wall, to justify the dredger working even for 2 or 3 months.

We received by the mail which arrived here on the 3rd April the Chief Engineer's letter, dated 17th March, enclosing an indent for the additional plant and machinery. Tenders are being taken in for the whole of the indent, but we have in our letter to the Chief Engineer, dated 11th April, 1922, questioned the necessity for some of the plant and have asked him to take your orders on the subject and cable a reply.

We have the honour to be, Sir,
Your obedient Servants,

(Sgd.) C. S. MEIK & BUCHANAN.

(XX.)

Testimonials and experience of Mr. Brims.

(Copy.)

28th March, 1923.

DEAR MR. HALCROW,

Herewith the other copies of my training and experience, which was not ready yesterday afternoon.

Yours sincerely,

(Sgd.) C. R. BRIMS.

(Copy.)

Outline of Training and Work Done by C. R. Brims.

1895-1900.

During this period I served my apprenticeship with Messrs. D. & C. Stevenson, civil engineers to the Northern Lighthouse Commissioners, Edinburgh, Scotland. While with this firm I was engaged in making surveys both land and marine, for lighthouses, river improvements, harbours, piers and new roads, and in the preparation of designs, working drawings, specifications and measurement of quantities for such work, and in the superintendence over the construction of same, also in preparing Parliamentary plans and estimates, &c. During this period I was also studying engineering at the Heriot Watt College.

1900-1902.

I left Messrs. Stevenson in December, 1899, and joined Messrs. S. Pearson & Son, Limited, Contractors, London.

I was engaged by them to take charge of the setting out, measuring up, and to superintend the construction of a storage reservoir, covering an area of about 80 acres, with a puddle wall and embankment, 8,800 feet long, also two overflows, a large aqueduct, and river diversion.

1902-1910.

I left Messrs. Pearson early in 1902, and joined Sir John Jackson, Limited, for their Simons Bay contract, Cape Colony, where I was employed until the end of December, 1910.

I was engaged by them to take charge of the setting out, measuring up, and to superintend the construction of the two breakwaters in connection with the new Admiralty Harbour Works, also certain other work in connection with the dry dock and permanent workshops.

The setting out and construction of the permanent railways and roadways, as well as our temporary railways, and 40- and 35-ton Titan roads, 40-ton Goliath roads, temporary jetty, and temporary stages and gantries for various machines.

1911-1912.

On the completion of the works at Simons Bay, I returned to London, and on calling at the offices of Sir John Jackson, Limited, in December, was asked to proceed at once to Ferrol, Spain, as chief engineering assistant. While there, I was engaged in setting out, measuring up, and superintending the construction of a dry dock, various buildings and roads in connection with same, the erection of ships, fitting out jetties, also the deepening of the tidal basin, by means of three bucket dredgers. I also had charge of all the repairs and maintenance of the various marine craft.

1912-1919.

On the completion of these works, I returned to England, and joined Messrs. Topham, Jones & Railton, Limited, Contractors, London. I was engaged by them as chief engineering assistant on a contract in Wales for three months, when I was sent north to take charge of the engineering side of the contract they had secured for the dredging of the approach channels to H.M. Dockyard, Rosyth, Scotland, acting also as assistant manager. This position I occupied until January, 1918, during which time we carried out several very urgent war works for the Admiralty.

In January, 1918, I was appointed Assistant Manager to take charge of an urgent dredging contract at Inverness. This work I completed by the end of May, 1918, when I was appointed Local Manager, in charge of the construction of two haul-up Slipways and two Piers which Messrs. Topham, Jones & Railton, Ltd., undertook to construct at H.M. Dockyard, Pembroke Dock, on behalf of the Admiralty.

1920-1921.

The above works were completed at the end of 1919, when I was appointed Manager in charge of the constructional work for a large Oil Storage Installation which Messrs. Topham, Jones & Railton undertook on behalf of the British Petroleum Co., Ltd., at Salt End, Hull.

1921-1923.

On completion of our section of the work at Hull, I joined the staff of the British Petroleum Co., Ltd., to take charge of and superintend the constructional work at nine large Oil Storage Installations, and later other work of a similar nature throughout England and Ireland.

(Signed) C. R. BRIMS.

100, Loraine Mansions,
Widdenham Road, N.7.
27th March, 1923.

MESSRS. C. S. MEIK & BUCHANAN,
16, Victoria Street, S.W.1.

DEAR SIRS,

Bombay Reclamation Scheme.

With reference to your conversation with me regarding an Engineer to take charge of and supervise the above work, and in confirmation of my verbal statement that I would be willing to consider same, I now have pleasure in sending you particulars of my general training and experience, together with particulars of the various dredging works supervised by me.

I shall be pleased to receive in due course full particulars of conditions of engagement, and should my application be favourably considered could arrange to sail within three months of notification.

Thanking you for recommending me to the authorities at Bombay.

Yours faithfully,

(Sgd.) C. R. BRIMS.

Outline of Dredging Work Superintended by C. R. Brims.

NOTE.—As all the dredging work I have been engaged upon has been carried out on behalf of the Admiralty it is impossible for me to give details of same. The following brief outline of the various works will I think, however, be sufficient to indicate that I have had extensive experience of this class of work, extending as it does over a period of 18 years.

At Simons Bay, South Africa, 1902-1910.

This consisted of two distinct sections of work, but for both sections a self-propelling hopper suction dredger capable of dredging to a depth of 30 feet was employed.

The first section consisted of dredging wide trenches to a uniform depth for the rubble foundations of a breakwater and two basin walls. The material dredged from these trenches was pumped into the hoppers of the dredger and deposited at sea.

The second section consisted of dredging a tidal basin of 28½ acres to a depth of 30 feet below low water of ordinary spring tides. Part of this material was taken to sea, but a large proportion was pumped ashore for reclamation purposes. The longest length of pipe line used for this was about 1,000 feet. The method adopted was as follows :—

A temporary skeleton jetty for berthing the dredger was constructed against one of the breakwaters, a pipe line was then laid from this jetty across the breakwater to the inside of same. The end of this pipe line, which overhung the inner slope of the breakwater, was supported by means of a simple light timber frame. Owing to the suitability of sand for reclamation by pumping, it was possible after a time to support the end of the line when extended by simply laying old railway sleepers on the sand previously pumped ashore.

All the material dredged was pumped into the hoppers of the dredger. The dredger then went alongside the temporary jetty, and after having the delivery pipe connected to the line on shore, the material in the hoppers was pumped ashore by means of the dredger's own pump.

At Ferrol, Spain, 1910-1911.

This consisted of the deepening of the existing tidal basin to a depth of 8½ metres below low water of ordinary spring tides by means of three bucket dredgers, the dredged material which consisted of silt, hard clay and rock being taken to sea in hopper barges.

Owing to the restrictions imposed by the authorities, blasting of the rock was not possible. The dredging of this was therefore a very slow and arduous task and

necessitated one of the dredgers being a heavy rock dredger. The other two which were much lighter craft were concentrated on the softer material.

The craft used for conveying the dredged material to sea were two steam hoppers, four dumb hoppers and two ocean-going tugboats for towing the latter. The total quantity dredged was about 800,000 cubic metres.

At Rosyth, Scotland, 1913-1918.

The work here comprised several dredging contracts, the two largest being the formation of the approach channel to the Naval Base (this was dredged to a depth of 30 feet below low water of ordinary spring tides) and the removal of a large bank in the middle of the River Forth, which was also dredged to a depth of 30 feet below low water of ordinary spring tides. The total quantity dredged in each case amounted to approximately eight million cubic yards. The material consisted of silt, soft clay, hard-bound gravel and boulder clay in the former case and soft silt and sand in the latter case.

Work was carried on continuously in two shifts of twelve hours each, five and a half days per week.

The craft employed were three bucket dredgers, six steam hoppers, two tugboats and several small craft.

The record output for one dredger on this work amounted to 73,500 barge cubic yards in one week of 11 shift.

All of the various dredging works here were completed within contract time, the approach channel to the Naval Base being completed as much as 12 months under the contract time.

At Inverness, Scotland, June-May, 1918.

The work here consisted of dredging channels through two banks in the fairway in the Inverness Firth. The material in one bank was composed of gravel and in the other all mud and silt. In the former case we had at times to contend with a six or seven knot tide. We therefore employed a heavy rock dredger on this bank. On the other bank, where the material was mud and silt, one self-propelling and one stationary dredger was employed.

All the material dredged was conveyed to sea in steam hoppers.

The craft employed consisted of three bucket dredgers, eight steam hoppers, two tug boats, one self-propelling coaling lighter, one motor-driven water boat, and three small launches.

At Pembroke Dock, Wales, 1918-1920.

The dredging work here consisted of the removal of the mud overlaying the rock on the site of two jetties and two haul-up slipways, and also the lowering of a mud bank opposite the two jetties.

The removal of the mud overlaying the rock was a very difficult operation owing to the impossibility of obtaining a suction dredger at the time. We therefore used a heavy rock dredger.

Owing to the uneven surface of the rock the buckets frequently caught in obstructions, stopping them revolving and throwing great strain on the buckets, links and pins. The conditions were severe and repairs consequently heavy Had it been possible to obtain a suction dredger at the time, the cost would have been considerably less and the time required for completion much shorter than it was.

The craft employed on the dredging work here consisted of one self-propelling rock dredger, fitted with buckets for dredging soft material, three steam hopper barges, one sea-going tugboat, and one small self-propelling steam water boat.

The work was proceeded with day and night in twelve-hour shifts, five and a-half days a week, but owing to the high level at which the rock was found over a large area of the site it was necessary to work tide work during a portion of the time.

During a gale immediately after the completion of the construction of the jetties and slipways, the water boat dragged her moorings, grounded on the side of a bank on the falling tide, and slid off on her side, going down in about 20 feet of water. The work of salving this vessel was carried out under my supervision, and was so successful that the hull was not damaged in any way by the lifting operations.

(XXI.)

16, Victoria Street,
Westminster, S.W.1.
11th April, 1922.

My dear Hepper,

I am much distressed to receive a letter from Lewis by this mail written from St. George's Hospital and I wonder if you are taking any action on the lines I suggested to His Excellency and to yourself. Possibly as his leave is nearly due you are letting him carry on to that date especially as it would be difficult for him to get a steamer passage by an earlier boat. On the other hand if you had Lewis examined by a Medical Board before he leaves India and they reported unfavourably he would not be able to return to India from leave without a clean bill of health. We feel very strongly that in the interests of the work there should be no chance of a repetition of this disastrous year of sickness.

We received by last mail an indent for additional machinery and rolling stock for the Back Bay Scheme aggregating in value over £90,000. We have written by this mail to Lewis challenging several of the items and we have asked him to discuss the matter with you and send us a cablegram with final orders.

We have pointed out that we have no wish to interfere with the discretion of the man on the spot or in any way to delay the work but that in the interests of economy we think his estimate might be cut down.

With kind regards,

Yours sincerely,

(Signed) GEO. C. BUCHANAN.

3rd June, 1922.

My dear Hepper,

I received this mail your letter dated 8th May, saying that you had postponed your "leave" and would not sail from Bombay until 8th July.

On the assumption that you were sailing for home on the 20th May, we were looking forward to a long talk with you on the subject of the Back Bay Reclamation Scheme, because we are seriously concerned about the lack of information we are receiving from the Chief Engineer, or as he is called in our agreement, the Resident Engineer. As you will now be at Bombay for another month we think it well to put the matter in writing and we have this mail written a letter to the Resident Engineer of which we enclose you a copy demi-officially.

Our agreement is very plain and we feel sure that you and the Government of Bombay are as anxious as we are that we should conform to that agreement and carry out conscientiously and thoroughly the duties laid down therein.

At present there appears to be a tendency on the part of Lewis to keep us in the dark and use us merely as agents for the purchase of plant.

If the works were being carried out by contract there would be no question as to the procedure; the Resident Engineer would receive his instructions from us and it would be his business to see that the contractor carried out the work accordingly.

As the work is being done departmentally the case is a little different; the Resident Engineer is taking the part of the Contractor and must so far as the execution of the work is concerned be permitted to exercise his own judgment but that need not hinder our supervision as responsible Engineers, or prevent our being kept fully acquainted with the progress and the cost of the work.

In all works of magnitude such as that in the Back Bay a complete record of progress comprising plans, photographs, and statements ought to be kept and if this is so there should be little difficulty in forwarding us copies periodically.

There can be little doubt that Lewis' health has broken down seriously and in the opinion of Mr. Meik and myself you would do well to have him examined at home by a Medical Board for an expression of opinion as to his fitness to continue hard work in the East.

But this and other points we can discuss on your arrival home towards the end of July.

Yours sincerely,
GEO. C. BUCHANAN.

Sir LAWLESS HEPPER,
Bombay.

(XXII.)

Statement put in by Sir George Buchanan.

Year.	*Amount. Lakhs of rupees.*	*Equivalent in sterling.*
January, 1913	400 ...	2,682,291
June, 1919	400 ...	3,328,125
February, 1922	400 ...	2,656,250
October, 1926	400 ...	2,979,166
January, 1913	700 ...	4,694,010
June, 1919	700 ...	5,824,218
February, 1922	700 ...	4,648,437
October, 1926	700 ...	5,213,541
January, 1913	1,000 ...	6,705,729
June, 1919	1,000 ...	8,320,311
February, 1922	1,000 ...	6,640,625
October, 1926	1,000 ...	7,447,916

It will be noted that the difference in sterling between 400 lakhs in 1919 and 700 lakhs in 1922 was only £1,320,312.

(59483) Wt. 1283—572 500 1/27 H. St. G. 11

EVIDENCE

Oral and Documentary

RECORDED BY THE

BACK BAY ENQUIRY COMMITTEE.

1926.

PART III.

ILLUSTRATIVE DOCUMENTS.

LONDON:
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I. DREDGING RESULTS OF THE "JINGA" AND THE "KALU" 1909 1913.

Results obtained from soundings taken on the ground actually worked over and dredged—

DREDGER "JINGA."

Period.	Area Dredged Squares.	Average Depth Dredged Feet.	Quantity Dredged Brass.	Hours Pumped.	Quantity Pumped Per Hour Brass.	Remarks.
June 16th, 1909, to July 19th, 1910.	19,550	18·29	3,57,660	1,330¾	269	With 30 ft. Ladder.
Jan. 23rd, 1911, to Mar. 23rd, 1911.	6,310	21·43	1,35,249	403¾	335	„ 40 „ „
Mar. 24th, 1911, to April 11th, 1911.	5,681	21·85	1,24,128	339	366	„ „ „ „
Oct. 9th, 1911, to Nov. 11th, 1911.						
April 17th, 1911, to May 2nd, 1911.	1,672	18·88	31,564	74¾	422	„ „ „ „ Through Floating Pipe only.
May 15th, 1911, to July 1st, 1911.	4,380	24·32	1,06,515	295	361	With 40 ft. Ladder.
Nov. 13th, 1911, to Jan. 31st, 1912.	8,429	26·44	2,22,894	480	464	„ „ „ „
Feb. 12th, 1912, to Sept. 21st, 1912.	18,558	26·59	4,93,590	1,220	404	„ „ „ „
Sept. 23rd, 1912, to Feb. 6th, 1913.	12,258	29·30	3,59,172	849	423	„ „ „ „
Feb. 25th, 1913, to July 12th, 1913.	13,236	27·27	3,60,982	848¾	425	„ „ „ „
Totals	90,074	24·33	21,91,754	5,841		
				38		Clearing Silt from Foundation for Walling.
				5,879		

DREDGER "KALU."

Period.	Area Dredged Squares.	Average Depth Dredged Feet.	Quantity Dredged Brass.	Hours Pumped.	Quantity Pumped Per Hour Brass.	Remarks.
May 12th, 1909, to May 31st, 1909.	620	13·00	8,062	53¾	150	No Measurements Taken; Estimated.
June 4th, 1909, to Aug. 1st, 1910.	19,559	13·05	2,55,343	1,626	157	With 30 ft. Ladder.
Aug. 2nd, 1910, to Mar. 7th, 1911.	7,302	19·00	1,38,759	859½	161	„ „ „ „
Mar. 8th, 1911, to July 23rd, 1911.	9,080	15·58	1,41,510	614	230	„ „ „ „
July 24th, 1911, to Sept. 28th, 1911.	4,772	21·14	1,00,964	394	256	„ „ „ „
Sept. 29th, 1911, to Oct. 20th, 1911.	1,614	22·50	36,315	144	252	„ „ „ „
Dec. 5th, 1911, to Feb. 22nd, 1912.	5,520	21.23	1,17,230	486¾	241	„ 40 „ „
Feb. 23rd, 1912, to April 27th, 1912.	6,424	20·61	1,32,400	395¾	335	„ „ „ „
Oct. 7th, 1912, to Jan. 29th, 1913.	8,888	22·43	1,99,400	645½	309	„ „ „ „
Jan. 30th, 1913, to July 12th, 1913.	13,496	23·12	3,12,084	900½	346	„ „ „ „
Totals of Actual Measurements.	76,055	18·65	14,33,005	6,066	236	
Totals including Estimated Figures.	77,275	18·65	14,41,067	6,119¾	236	

II.—SUMMARY OF THE PREVIOUS HISTORY OF THE BACK BAY RECLAMATION SCHEME SUPPLIED BY THE GOVERNMENT OF BOMBAY.

The following is an outline of the history of the Back Bay Reclamation Scheme.

1. In the year 1863 the Government of Bombay (Sir Bartle Frere being Governor) submitted to the Government of India proposals for the reclamation, by a company, of 1,500 acres of the foreshore of Back Bay. In January 1864 this proposal was sanctioned by the Government of India. Later in the same year the Government of Bombay requested sanction to invest 40 lakhs in the company, the total share capital of which was Rs. 200 lakhs. The Government of India refused to agree to this proposal, their main objection being that there was not sufficient information before them to enable them to estimate the risks. The reclamation was, therefore, commenced without Government assistance, but the cost of the work proved to be greater than had been anticipated. The failure of the Asiatic Banking Corporation in which the company had deposited 90 lakhs proved a further source of embarrassment. The company had, therefore, to be wound up in the year 1866.

2. Nothing further was done in the matter until 1887 when Lord Reay's Government appointed a committee to prepare a comprehensive scheme for the future extension of the city. The committee again advanced the reclamation of Back Bay as a means of providing to some extent for the expansion anticipated. No action was taken on the committee's report until 1897, when the subject was revived by the Government of Lord Sandhurst. Another committee was appointed during that year, and as a result of its recommendations the City Improvement Trust was constituted. This committee laid stress on the desirability of reclamation along the west side of Colaba point, and in consequence 90,000 square yards were reclaimed by the Trust as a tentative measure; and the result proved to be satisfactory and profitable.

3. In 1907 Lord Lamington's Government appointed a committee to consider a rough reclamation scheme which had been prepared in the Secretariat for an area of 973 acres at a cost of Rs. 176 lakhs. The committee's recommendations increased the cost to Rs. 320 lakhs, which was later reduced to Rs. 284½ lakhs. No action appears to have been taken on this report at the time.

In January 1911 the Government of Bombay submitted proposals for reclamation for the general approval of the Government of India. Two schemes were submitted: one for the above-mentioned area of 973 acres; and one for 1,272 acres at a cost of Rs. 388 lakhs. The project actually advocated by the Government of Bombay was for the reclamation of 1,100 acres, for which no estimate had been prepared.

4. In submitting this scheme the Government of Bombay recommended that it should be undertaken by Government, but omitted to state whether the provincial or Imperial Government, or both jointly, were implied. The Government of India asked the local Government to consider whether the work could not be carried out, under Government control, by some outside agency, *e.g.*, a syndicate, the municipal Corporation, or Improvement Trust, with assistance from provincial revenues, or by a Reclamation Trust created *ad hoc*. In reply the Government of Lord Sydenham urged that the scheme was a productive public work of the highest utility and deprecated the idea of its being taken up by an outside agency, for the reason that interests vitally affecting the City of Bombay would be subordinated to the ends of that outside agency. The idea of making over the work to the Municipal Corporation or to a local Trust was also dismissed on the grounds that the rate of interest payable would be higher than that at which Government could borrow; that this difference would reduce the ultimate profit without conferring any benefit on the State; and that neither the Corporation nor the Improvement Trust could be saddled with a work of such magnitude in addition to their ordinary duties. In the circumstances the local Government urged that the work should be undertaken on the financial responsibility of Government, the Imperial Government to raise the loans and to place them at the disposal of the local Government.

5. The Government of India considered that the operations of the Improvement Trust and the reclamation might be mutually destructive. They also doubted whether the local Government had sufficiently examined the possibility of the extension of the city in other directions. For these and other reasons the Government of Lord Hardinge hesitated to accord their approval to the scheme. An informal arrangement was, however, made with the Government of Bombay under which it was agreed that a strong and fully representative committee was to be convoked to consider the future development of Bombay City. It was also informally agreed that, should it eventually be decided, as a result of the committee's deliberations, that a scheme of reclamation in Back Bay was desirable, a beginning might be made in this direction on a small piece of 84 acres. At the same time the Government of Bombay was informed that there

was no objection to a complete survey and estimate being prepared by Mr. Kidd, of Messrs. Lowther, Kidd & Co., and the scheme investigated in detail and the financial aspect discussed.

6. In January, 1912, the Government of Bombay forwarded to the Government of India Messrs. Lowther, Kidd & Co.'s terms for investigating the scheme. In February, 1912, the Government of India sanctioned by telegram an expenditure of Rs. 1,57,500 on the investigations and preparation of estimates, etc., by Messrs. Lowther, Kidd & Co. The Government of Bombay then forwarded the estimates prepared by the firm for reclaiming about 1,145 acres in Back Bay and 124 acres on the east side of Colaba for Military purposes, the amounts being 325 lakhs and 37 lakhs respectively. With a view to strengthen their position in urging sanction upon the Government of India, the Government of Bombay appointed in November, 1912, under the presidentship of Sir Vithaldas D. Thackersey an unofficial committee of Bombay citizens to advise Government on certain points having an important bearing on the scheme. The committee's recommendations were as follows :—

> "We are convinced that, unless some means are found to provide extra dwelling accommodation in the Southern portion of the Island near the business quarters, the overcrowding in the city proper will continue to increase with the inevitable result of forcing up rents still more. Such a contingency would no doubt benefit the landlords, but it would mean a great hardship to the general public who pay rents. If the reclamation is practicable, as we believe it to be, it should be undertaken immediately in order to prevent the possibility of such a contingency arising The strongest point in favour of the Reclamation being taken up immediately is that Government will be able to provide a large area of land for residential purposes near the business quarters at a reasonable rate without appreciably affecting existing interests. In recent years the shop rents in the Fort have enormously increased and the demand for shop area is augmenting yearly. The burden of this continuously increasing rent cannot but affect the general public who must pay the same in the increased prices for goods. The schemes undertaken by the Improvement Trust in the North of the Island or the development of Salsette cannot meet this difficulty. If the insanitary condition of the north part of the Fort is to be improved by partial demolition of the buildings to give sufficient air and light to the remaining properties, it can be made feasible only by the extra supply of land near the Fort, which supply the proposed reclamation will provide.
>
> "In conclusion, we wish to lay stress on the fact that the scheme is not only financially sound, but that it adds to the beauty of the city, and will, after some years, add considerably to the resources at the disposal of the Improvement Trust in its efforts to reclaim insanitary areas."

That report was forwarded to the Government of India and it was urged upon them that sanction may be accorded to the scheme being carried out by the local Government. In September, 1913, a letter was sent to the Government of India stating that a further communication would be sent in the matter and that further consideration might be held up meantime.

7. The committee informally suggested by the Government of India and referred to in paragraph 5 above sat in the cold weather of 1913-14. In their report, after discussing the subject at length with due regard to the prospective developments of Bombay in other directions also, the Committee finally recommended that Government should confine itself to reclaiming a small area of about 100 acres for the expansion of existing public (and especially educational) institutions. Their recommendation was framed with two objects in view, firstly, to make available, purely for Government purposes, an additional area urgently required in the neighbourhood of the Fort, and, secondly, to provide a reliable check on the correctness or otherwise of the estimates upon which the wider scheme was based. They further stated : "When that is definitely known it is conceivable that further reclamation for the provision of space for residence might be regarded as practicable and even desirable." Copies of this report were sent to the Government of India on 5th June, 1914. Subsequently, in 1916, the Government of Bombay submitted an estimate for the reclamation of 220 acres of Back Bay. Mr. Kidd's estimate of the cost of this work amounted to Rs. 84 lakhs, and he assumed a period of construction of four and half years ; the Government of Bombay revised these figures to 124 lakhs and eight years respectively, and further stated that they were prepared to finance the work from provincial revenues. The Government of India, however, found themselves unable to accept the scheme as submitted, as they were doubtful whether the Government of Bombay were actually in a position to undertake to finance the scheme, and the project was returned to the Government of Bombay with the intimation that, should they desire to proceed with the more modest scheme proposed by the Development Committee of 1913-14, and be able to satisfy the Government of India that the cost could be met from provincial resources, the Government of India were prepared to give such a scheme their most careful consideration and, should it be sanctioned and prove financially successful, the profits accruing could

be applied to its further extension. This was in February, 1917, and owing to the war the matter remained pending.

8. In December, 1917, a syndicate was formed comprising the Honourable Mr. Lallubhai Samaldas, Sir V. D. Thakersey, Sir Sassoon David, and Sir Fazalbhoy Currimbhoy who addressed the Government of Bombay on the subject of the Back Bay Reclamation Scheme, and asked for a concession as they proposed to float a company with the necessary capital. On the 19th of December of the same year Messrs. Tata Sons, Ltd., addressed the Government of Bombay as to the terms on which Government would be prepared to entrust the work to a private Corporation, and asked for an option on the scheme for twelve months. Subsequently, the two syndicates combined and on 15th January, 1918, their representatives interviewed the Honourable Mr. G. Carmichael, who was, at the time, Finance Member in a Government composed of :—

His Excellency the Right Honourable Lord Willingdon, Governor,
The Honourable Mr. G. Carmichael,
The Honourable Mr. G. Curtis,
The Honourable Sir Ibrahim Rahimtoola.

On the 28th April, 1918, the following note summarising the position in respect to the Syndicate, was written by the Honourable Mr. (now Sir) G. Carmichael :—

" *Back Bay Scheme.*—The two interests which applied for an option of the reclamation concession have combined and I understand their interests are to be divided as follows :—

Sir Sassoon David		
Sir Shapurji Broacha		
Sir Fazalbhoy Currimbhoy	$\frac{1}{2}$	
Sir Vithaldas Thakersey		
Mr. Lallubhai Samaldas		
Messrs. Tata & Co.	$\frac{1}{2}$	
Tata's Industrial Bank		

" The sharers to be jointly and severally liable within their half shares and the partners in the two half shares to be jointly and severally liable for the whole.

" 2. They contemplate forming a syndicate with 20 lakhs paid up capital to make the further investigation which is necessary, to work out the method of financing the scheme, and to arrange for promoting the Company.

" 3. As regards Tata's Industrial Bank getting support from Lloyd's Bank, apparently it is a syndicate in London with whom negotiations are going on. I understand that the basis on which the syndicate will come in has not yet been settled. If it is settled satisfactorily then the Bank would probably have a strong board; which was one of the points on which the Honourable Mr. Curtis entertained some doubts.

" 4. The applicants at first entered into negotiations with Messrs. Lowther and Griffiths, but these have been finally broken off and they are now in treaty with the firm of Coode, Mathews, Fitzmaurice & Wilson, of which the head partner is said to be Maurice Fitzmaurice, at present Controller of Canals in the United Kingdom. The head of the firm might, it is said, be able to come out to India if he were relieved of his post at home, but this could not be before Christmas. In the meantime Messrs. Tata & Co. wish to ask the firm to send out a younger man to start investigation before the monsoon.

" 5. Colonel Grisewood, on behalf of Messrs. Lowther and Griffiths, has entered a protest against the way in which that firm have been treated by Messrs. Tata & Co., and at the same time applies for a concession on behalf of his principals. He indicates three lines on which they would be willing to negotiate. These all depend on Government ultimately finding the money, though under the third proposal the firm would take part payment in the shape of a long lease (say for 60 to 75 years; the figure is not mentioned but I understand this is roughly what is intended) of part of the reclaimed area. There are men of sound judgment in Bombay who think that it would be a profitable scheme for Government to take up soon after the war is over. But there would be a strong body of opinion the other way, and there is no doubt in my mind that if we wish to avoid delay we should leave the project to private enterprise. Government will after the war have many more urgent claims on their revenue or loan funds.

" 6. If this is agreed to, then we should, I think, give the option to the first applicants. In any case it should go to an Indian Company in the end, and with the original applicants against them Messrs. Lowther and Griffiths could not form a Company in Bombay, even if they proposed to do so, which they apparently do not.

" 7. If the option is given to Messrs. Tata & Co. and their syndicate we should not dictate their choice of the engineers whom they may employ. All we need see to is that they do employ a firm of established repute in this line of work.

" 8. As far as I can see, if Government do not undertake the work themselves they are not under any obligation, legal or otherwise to Messrs. Lowther and Griffiths. For the work which they did they were paid.

" 9. Nor are we concerned with the reasons why the negotiations between Messrs. Tata & Co. and Messrs. Lowther and Griffiths failed.

" 10. I presume that before granting the option asked for we should indicate conditions. The reclamation rights of the Improvement Trust expire in September, 1918, and there is no difficulty on this point. It is possible, however, that legislation will be necessary to obtain the right of laying the pipes across private lands and Municipal lands between the dredgers in the harbour and the reclamation area.

" 11. As regards conditions, the points which occur to me are—

(*a*) Approval of the Engineer or Engineering firm employed.

(*b*) Approval of the design of the scheme.

(*c*) Government to be satisfied that the finances are sufficient before the scheme is commenced.

(*d*) Government to have an option to take over at cost price an area not exceeding a certain maximum.

(*e*) An area of 100 acres to be provided for a public park free of charge the Municipality to have an option to add a further area to the park, subject to a maximum, say, of 50 acres more, by purchase at cost price.

(*f*) The area of 124 acres on the east of the island to be reclaimed on behalf of Government at a contract price.

(*g*) The layout to be approved by Government.

(*h*) The Company to bear the burden of any possible claims on account of damage caused by the reclamation to the amenities, etc., of existing properties.

" 12. As regards (*d*) above, the origninal idea was to reserve 40 acres for Government house. I do not think this was a sound idea as the land at the point will not be very high above high water. We have, however, to provide for many other public buildings. It is also a question whether we should not retain an option on land which Government could give out on lease.

" 13. The question will have to be examined whether higher sanction is needed before giving the concession."

This note was circulated to the Governor in Council and finally the Government of Bombay decided to obtain a report on the scheme by an independent expert.

In accordance with this decision, a telegram was sent to the Secretary of State for India by the Government of Bombay on the 16th October, 1918, stating :—

" Government of Bombay consider a re-examination of the Back Bay Reclamation Scheme a matter of special urgency, and hence shall be obliged if best qualified man available is chosen and sent to Bombay for that purpose. He should know recent work of the same kind and latest mechanical devices and be entirely independent of Lowther, Griffiths, and Tata Syndicate."

Shortly after Sir George Lloyd succeeded Lord Willingdon as Governor of Bombay on 16th December, 1918.

No reply having been received from the Secretary of State a further telegram was sent to him on 8th April, 1919, stating :—

" *Back Bay Reclamation Scheme.*—Government of India had asked you to send out best expert available to examine and make final report on above. Government of India had also asked us to send all plans to Delhi for transmission to you in order that expert may study them before departure."

" (1) I think this procedure involved unnecessary delay in view of the fact that expert must be here to see conditions just before monsoon breaks as well as after it.

" (2) I have consulted Government of India, and Sir Claude Hill concurs with me in proposing you should send expert out at once to arrive Bombay not later than third week of May.

" (3) All plans and information essential to experts' study now here.

" (4) Lord Sydenham or W. L. Cameron, late Chief Engineer, Bombay, would advise regarding choice of expert.

" (5) Failing your ability to find expert in short time available, my Government would agree to using Sir George Buchanan whose services would probably be available and whom the Governmenat of India recommend.

" (6) My telegram has been drafted in consultation with the Government of India and is being communicated to them.

" (7) Please telegraph immediately whether expert can be found in time to arrive by middle of May or whether we should proceed with Buchanan."

To this, the Secretary of State replied on the 25th April, 1919, stating—

" Sydenham suggests appointment of Cameron as expert and doubts whether it is possible to send a new man out in May. I have not sounded Cameron. I probably could secure Frederick Palmer of Randell Palmer and Tritton, if you would wait for him till October. He was for nine years Chief Engineer for Calcutta Port Trust, and then Chief Engineer to Port of London Authority. His firm is not interested in concession is closely connected with India Office and of highest standing. What are your views? Is it essential that the expert if he has already the knowledge of monsoon effects should be present throughout entire period of monsoon? Any such condition is deterrent."

A telegram expediting reply to the telegram of 25th April was sent on 16th May, 1919, and on receipt of this telegram, another telegram was sent by this Government to the Secretary of State on 26th May, 1919, stating :—

" Your telegram, dated 16th May. Reply to this was postponed in view of impending discussion with Sir Claude Hill, and his return to England. My Government were opposed to employment of Cameron, and in view of difficulty of getting Palmer out before October, decided to employ Sir George Buchanan, who is at present engaged upon the work and will probably, after concluding preliminary investigation, proceed home to make further inquiries regarding dredging plant and material."

9. On the 30th May, 1919, Sir George Buchanan was asked to prepare a report, the terms of reference being :—

" (1) To examine and report on the scheme prepared by Mr. Kidd of Messrs. Lowther, Kidd and Company, for the Reclamation of 1,145 acres in Back Bay, Bombay (known as the 1912 project) or any portion thereof which Government may hereafter designate. The Scheme comprises :—

(*a*) the construction of a sea-wall.

(*b*) filling-in within the area enclosed by the sea-wall by means of dredging in the harbour on the east side of the Colaba Peninsula, and pumping the material across the narrow neck at various points in the Back Bay;

(*c*) Covering with a layer of moorum the land so reclaimed.

" (2) A specific opinion is required on the following points :—

(i) the practicability of the scheme from the engineering point of view;

(ii) the suitability of the type of wall proposed or alternate suggestions for better types;

(iii) the suitability of the proposed method of reclamation by means of dredging, or alternative proposals for same.

" (3) Mr. Kidd, in his project of 1912, gave a general estimate for the above but unaccompanied by details of cost of dredgers and other plant. A revised estimate is required for the whole of the scheme giving details showing :—

(*a*) cost of dredging plant,

(*b*) cost of dredging,

(*c*) cost of sea-wall, along with the price of plant in connection with with the same,

(*d*) cost of moorum filling and plant required.

" (4) A programme of construction is required along with an opinion as to the order in which the work should be executed, and the time within which the various sections could be completed from the date of the order to begin the work.

" The question whether the entire work should be given out as one complete contract or divided up into a number of small contracts may also be considered, and whether it might not be advisable to carry out some items of the project, or even the whole of it, departmentally.

" (5) A separate report and estimate on above lines is required for the reclamation of the east of the Peninsula from Pilot Pier to Sassoon Dock, known as the East Colaba Project, and an opinion as to whether it could be carried out by dredging plant already in Bombay."

Asking for sanction to the Scheme.

10. Sir George Buchanan accordingly prepared his report in September, 1919, and submitted it to Government in October, 1919. On receipt of the report, the Government of India were addressed under this Government letter No. 10550, dated the 4th December, 1919, stating :—

" Sir George Buchanan has now presented his report and I am to say that this Government understands that the Government of India are prepared to accord administrative approval. The Governor in Council does not consider it necessary to discuss the 1912 project again. As pointed out by Sir George Buchanan in paragraph 28 of his report, Messrs. Lowther and Kidd's plans reveal such an unusual absence of detail that it makes examination of figures extremely difficult

from a technical point of view. In the circumstances, the Governor in Council proposes to discard this scheme entirely and to concentrate attention solely upon Sir George Buchanan's own scheme, which includes the same area as that covered by the 1912 project, viz., 1,145 acres.

" 4. On the technical aspect of the new scheme, the Governor in Council offers no opinion. He is fully prepared to accept Sir George Buchanan's carefully considered views on the practicability of the scheme from an engineering point of view, on the type of wall required for the reclamation and on the method of reclamation.

" The Governor in Council is confident that the Government of India will have little hesitation in accepting Sir George Buchanan's opinion, in view of the fact that opportunity has been afforded to your Department to discuss all technical details with Sir George Buchanan himself. I am to add that the Governor in Council is prepared in view of a possible increase of rates for labour or materials to add 10 per cent. to the total of the scheme as estimated by Sir George Buchanan, and the total cost of the project may be roughly taken at Rs. 4 crores for the purposes of finance.

" 5. Taking the area to be reclaimed at 1,145 acres, the cost of reclamation and equipment works out under the present scheme at Rs. 6·63 per square yard. Assuming, however, that of the total area reclaimed 400 acres are required for roads and parks, the net area available for building is 745 acres, so that, if the charge for the whole scheme is debited against this area, the net cost per square yard works out at Rs. 10·19. The whole of the area, however, will not be available for sale or lease to the public. A considerable portion must be reserved for Government building, but I am to say that there is no present intention of reserving any portion of this area for a new Government House as was originally suggested. How much will be so reserved cannot be stated at this stage, but assuming for the sake of argument that as much as one-half of the area available for building will be required for Government purposes, which is of course an extremely outside figure, the net cost of the whole scheme per square yard of area available for sale or lease to the public works out at Rs. 20·38 only. If interest charges are included this figure might be raised, however, to Rs. 30. The saleable value of this area is necessarily a matter of conjecture, but some guide to it can be discovered from the prices at which land in the adjacent business area of Bombay is now changing hands. Sales of such land at prices ranging from Rs. 300 to Rs. 500 per square yard are of common occurrence. As much as Rs. 1,000 per square yard have recently been paid for land in the Fort and a case is known in which Rs. 1,200 per square yard were actually offered and refused. It is not of course anticipated that the average price of the saleable area will reach anything like so high a figure, but the Government in Council is confident that the most conservative estimate an all-over price of Rs. 100 per square yard can safely be relied upon, against an estimated cost of Rs. 20·38, or with interest charges Rs. 30. Allowing therefore for the largest possible margin of error both in the estimated cost of reclamation and the estimated value of the area available for sale or lease, and without taking into consideration the fact that, should all or several of the Government buildings in the Fort area be tranferred to the reclamation, and the sites on which they stand be sold together with the buildings themselves, which would realise an enormous sum, it is evident that the proposed scheme will be immensely profitable to Government. In these circumstances the Governor in Council trusts that the Government of India will have no hesitation in moving the Secretary of State to accord his sanction with the least possible delay. Meanwhile it is of first importance that the scheme should be accepted by the Government of India and sanction given by them to the purchase of dredging plant in anticipation of the Secretary of State's sanction of the whole scheme. It is understood that there is a precedent for this procedure.

" 6. * * * * * *

" 7. Finally, I am to say that the scheme forms only a part of a very large programme of development which this Government propose to undertake in the immediate future, and the question of financing all these local schemes has been the subject of a recent discussion at Delhi. In accordance with the decision then arrived at, this Government will shortly address the Government of India again on the subject of raising locally the funds required for the project under consideration, and on the further question of financing in each year, in consultation with the Imperial Government, the other important projects now under contemplation. It is only necessary here to state that the Governor in Council understands that the Government of India have appreciated the importance of these housing and development schemes, and have decided to accord their full support of these projects, leaving the question of financing the necessary loans by Provincial or Imperial borrowing to be decided in accordance with the circumstances obtaining in each

year. I am to ask that telegraphic intimation may be given as regards the immediate sanction required to the proposed purchase of the dredging plant, as the offer quoted by Sir George Buchanan is only open for a very short period longer."

Secretary of State's sanction to the Scheme.

11. A further letter was sent to the Government of India on 4th February, 1920, setting out in detail the various development schemes including the Back Bay Reclamation Scheme, and the executive authority which would carry out *inter alia* the Back Bay Reclamation Scheme, and the mode in which the scheme was to be financed along with the other development schemes. The Secretary of State gave his approval to the scheme outlined in previous letters in his telegram dated 4th May, 1920, stating " I desire to acknowledge the admirable work of the Government of Bombay in devising scheme, which is conceived on bold lines, and subject to suitable scheme of finance being evolved, I am prepared to accept proposals in principle." The final sanction to the proposed taxation and to a draft bill was received in June, 1920.

Introduction of the Bill for the Amendment of the Acts in the Legislative Council.

12. As a result of the above sanction a bill to amend the City of Bombay Improvement Act, 1898, and the City of Bombay Municipal Act, 1888, was introduced in the Local Legislative Council in August, 1920. In his speech introducing the bill His Excellency Sir (now Baron) George Lloyd referred in the following terms to the Back Bay Reclamation Scheme, and the mode in which it was proposed to carry it out along with the housing and other Development Schemes :—

" Briefly, then, the Directorate will (*a*) carry out with the assistance of its engineering staff the Back Bay Reclamation Scheme and any other reclamation schemes which may be found necessary in or near Bombay City.

" (*b*) It will undertake the whole of the industrial housing scheme.

" (*c*) It willl organise systematically the supply of building materials for its own work and of those works with which it is connected. One of the main reasons for the inadequacy of housing for the present day, as I have already mentioned, is the high cost of materials. It seems to us unlikely that the shortage of housing will be made good unless the State steps in and enables private individuals and companies to build more cheaply than they can to-day.

" (*d*) It will take over from the existing Secretariat all questions relating to the acquisition of land in the city of Bombay and all questions regarding the utilization of Government land. It will be consulted with regard to all proposals affecting land in Bombay City which are submitted by local bodies and railway companies. I wish here to emphasize the fact clearly that the Directorate will not have any powers whatever of interference with existing local bodies other than those which Government at present has. It will merely do on a wider scale and in a more efficient manner what Government has already been doing, or I should rather say, what Government would have wished to do but which for lack of personnel and organization it has not been able to do when confronted with such large and imperative reforms. We wish particularly to avoid creating any new authority; we wished our own authority, however, to be as effective, expeditious and prompt as we could make it in view of the immense task ahead of us. Its success must, therefore, depend largely on personal influence and on the public experience of its utility, inasmuch as it has no new powers of interference of any sort.

" (*e*) It will carry out large schemes for the systematic development of Salsette. This can be effected in two ways: (1) by town planning schemes to be carried out by local authorities and (2) by the purchase of areas outright with a view to re-sale after development with the least possible cost.

" (*f*) It will secure an adequate water supply for the whole of Salsette when it is developed as an urban area. Provisional arrangements for the immediate future have been made with the Bombay Municipality, but it is probable, when the area is developed, this will be inadequate. If this is so, an alternative supply must be obtained.

" (*g*) The Directorate will do its best to deal with the supply and distribution of the electrical energy in the area outside Bombay. Transmission lines of one of Messrs. Tata Hydro-Electric schemes run across Trombay, while those of another are being erected towards the east of Salsette. A central authority will be useful for the control of the supply of both for domestic and industrial purposes.

" (*h*) The Directorate will also take over the improvement of communications with Salsette. The question of improving railway communication with Trombay is already under discussion with the G. I. P. Railway, but that of linking up with Bombay City large areas in Salsette which are so admirably suited for

residential purposes but are practically without communications remains to be considered and grappled with.

" (*i*) The Directorate will co-operate with the Port Trust in the Development of the Bombay port, more particularly if the scheme is ultimately adopted, in the development of a new dock area and ship-building area on west Trombay. A proposal to transfer to this area the Royal Indian Marine Dockyard is also under consideration."

None of the members of the Council criticised the scheme at that time, but on the contrary they commended the scheme and congratulated Government on the boldness and courage shown in undertaking the scheme, which the previous Governments were unable to tackle successfully for one reason or the other. The scheme was considered to be a very sound one and expected to yield a huge profit to Government.

No suggestion regarding the Port Trust and the Royal Indian Marine's consent being obtained for dredging in the harbour.

13. There appears to have been no suggestion at this period that it was necessary to consult the Royal Indian Marine and the Port Trust with regard to possible restrictions on dredging in any area in the harbour.

Dredging plant.

14. In paragraph 47 of his report Sir George Buchanan recommended that the dredging plant should be ordered forthwith.

In paragraph 7 of this Government letter of 4th December, 1919, the Government of India were requested to send telegraphic intimation as regards the immediate sanction required to the proposed purchase of the dredging plant as the offer quoted by Sir George Buchanan was only open for a very short period. The placing of the contract was sanctioned by the Secretary of State in the beginning of May, 1920, and the order for the dredging plant was placed by the Director-General of Stores. The exact date of the placing of these orders is not known to the Government of Bombay, but it must have been placed immediately after the sanction of the Secretary of State for placing the contract.

Purchase of dredger " Kalu."

15. The purchase of the dredger " Kalu " was also recommended by Sir George Buchanan in his letter dated London, 24th September, 1919, to Sir George Curtis, in the following terms :—

" I think your Government ought to ask the Government of India not to sell the ' Kalu ' at present, because with a new pipe line she would do very well for the reclamation on the east of the Colaba Peninsula between Pilot Bunder and Sassoon Dock, which work might go on almost at once."

It was finally decided to purchase the " Kalu " for £75,000 on 21st November, 1919, presumably after consulting Sir George Buchanan, who was in India at that time.

16. From the 3rd January, 1921, the reform system of Government came into force, and the Government then consisted of the following Members :—

His Excellency Sir George Lloyd, Governor.
Honourable Sir George Curtis, Finance Member.
Honourable Sir Ibrahim Rahimtoola, Revenue Member.
Honourable Mr. Maurice Hayward, Home Member.
Honourable Sir Chimanlal Setalvad, General Member.

Sir Chimanlal Setalvad was administrative member in charge of the Development Department until he resigned in June 1923, and the Honourable Mr. Cowasji Jehangir became administrative Member. In April 1921, the Honourable Sir George Curtis was succeeded by the Honourable Mr. Lawrence as Finance Member.

The officers of the Department were as follows :—

Director	Sir Lawless Hepper, from the 8th November 1920 up to the present time with certain brief intervals of leave.
Secretaries	Mr. P. W. Monie, C.S.I., from 8th November 1920 to 8th July 1922, after which he acted as Director up to 7th October 1922.
	Mr. J. R. Martin, C.I.E., from 8th July 1922 to 28th November 1924, with an interval of 3 months from the 5th July 1924 to 4th October 1924, when he acted as Director.

Secretaries (continued)		Mr. R. D. Bell, C.I.E., from 5th July 1924 up to the 1st April 1926, since when he acted as Director with a short interval from 4th October 1924 to 28th November 1924 when he went on special duty in the Public Works Department, Secretariat.
		Mr. A. W. W. Mackie, I.C.S., from 1st April 1926 up to date.
Chief Engineers		Mr. Ll. W. Lewis, C.I.E., from 11th December 1920 to 12th July 1924 with an interval of leave from 20th May 1922 to 10th October 1922.
		Mr. G. M. O'Rorke, C.I.E., acted as Chief Engineer from 20th May 1922 to 10th October 1922 and 21st April 1925 to 19th July 1925.
		Mr. H. A. Elgee, M.I.C.E., from 12th July 1924 to date, with an interval of leave from 21st April 1925 to 19th July 1925.

III.—AGREEMENT ENTERED INTO WITH THE FIRM OF MESSRS. MEIK AND BUCHANAN, CONSULTING ENGINEERS, FOR THE BACK BAY RECLAMATION SCHEME.

MEMORANDUM OF AGREEMENT made this 17th day of March one thousand nine hundred and twenty-one Between CHARLES SCOTT MEIK and SIR GEORGE CUNNINGHAM BUCHANAN, K.C.I.E., carrying on business as Civil Engineers in partnership under the name of Messrs. C. S. MEIK & BUCHANAN at 16 Victoria Street Westminster in the County of London (hereinafter called " The Firm " which expression shall include the said Charles Scott Meik and Sir George Cunningham Buchanan and their successors being partners in the firm and their and each of their respective executors and administrators) of the one part and THE SECRETARY OF STATE FOR INDIA IN COUNCIL (hereinafter called " the Secretary of State ") of the other part.

WHEREAS the Secretary of State is about to carry out a Scheme for the reclamation of a part of Back Bay Bombay which is known as the Back Bay Reclamation Scheme and which comprises the whole of the works described in the report made by Sir George Cunningham Buchanan to the Government of Bombay in September one thousand nine hundred and nineteen.

AND WHEREAS the Firm have been engaged by the Secretary of State as Engineers of the Back Bay Reclamation Scheme and of all works in connection therewith upon the terms hereinafter mentioned.

NOW IT IS HEREBY AGREED as follows :—

1. The Firm agree to act as the Engineers of the Secretary of State in carrying out the said Scheme and in the construction and execution of all works connected therewith (hereinafter referred to as " the works ") until the final completion thereof and the Firm shall at all times assist and advise the Government of Bombay in all matters relating to the execution of the works and shall supervise the same and undertake and perform all work and duties devolving upon Engineers of large works and in particular the following work and duties namely :—

Work in England.

(*a*) The preparation of the working drawings specifications schedules of quantities and rates and estimates of cost for the whole of the work included in the report of Sir George Cunningham Buchanan and such work shall be commenced forthwith and all such drawings specifications schedules and estimates and any fresh or amended drawing specifications schedules of quantities and rates and estimates as may from time to time be required during the progress of the works shall be promptly prepared and forwarded to the Government of Bombay and shall become the property of the Secretary of State.

(*b*) The approval in conference and in conjunction with the Consulting Naval Architect to the Secretary of State of the detailed drawings and specifications of the dredger and floating pipe line and the final inspection and supervision of tests and trials.

(*c*) The approval in conference and in conjunction with the Consulting Naval Architect to the Secretary of State of the detailed drawings and specifications of intermediate pumping stations, shore pipes and the general inspection and trials of the same.

(*d*) The preparation of plans and specifications for all other plant required in connection with the construction of the works and the inspection of such plant and any material required for the works prior to shipment.

(*e*) Correspondence with the Government of Bombay or any Officer deputed to act on their behalf, including any reports from time to time required by Government in respect of the dredger plant or material or the progress of the works.

Work in India.

(*f*) During the whole period of execution the works shall be closely supervised by the Firm, and Sir George Cunningham Buchanan shall devote the greater part of his time to this particular work, and shall, unless the Bombay Government shall agree otherwise, visit Bombay this year and in every year after the monsoon when the working season begins, and remain in Bombay for such period during the working season as he or the Government of Bombay may consider necessary to ensure the complete and satisfactory supervision of the works, and shall also if necessary, in his own opinion or in the opinion of the Government of Bombay make additional visits during any monsoon.

2. If the Government of Bombay shall from time to time require any alterations in the works before or after the commencement thereof or shall require any additional works to be executed all work required to be done in connection therewith shall be within the duties of the Firm under the preceding clause.

3. A Resident Engineer and also a Deputy Resident Engineer (if required and if his appointment is approved by the Government of Bombay) will be nominated by the Firm and will carry out the details of the works in accordance with the Firm's instructions, but subject to the control of the Director of Development or other officer appointed by the Government of Bombay, and they, as well as the whole of the staff, both Engineering and Clerical employed in India in connection with the works, will be paid by the Government in Bombay.

4. In consideration of the services to be rendered by the Firm as aforesaid, the Secretary of State will pay the firm as remuneration a sum equal to two per cent. on the net expenditure incurred by the Government of Bombay on behalf of the Secretary of State in carrying out the works except that in the case of the dredger and of such other plant as is constructed under the joint control of the Firm and the Consulting Naval Architect to the Secretary of State and on which the Consulting Naval Architect to the Secretary of State receives one per cent., the remuneration of the Firm shall be calculated at one per cent. only. For the purpose of payments on account of the Firm's remuneration in respect of plant (including the dredger) the remuneration shall be calculated on 75 per cent. of the expenditure on the plant subject to final adjustment when the plant is disposed of or no longer required or on completion of the works. Such remuneration shall include all the travelling and incidental expenses incurred by the Firm and also their office staff and inspection and other charges in the United Kingdom and journeys to and from the United Kingdom and India.

5. Payment on account of the Firm's remuneration in respect of work paid for in India shall be made quarterly in rupees in Bombay. Payment on account of the Firm's remuneration in respect of plant paid for through the India Office shall be made quarterly in sterling in London. The said remuneration shall be finally adjusted upon the completion of the works or upon the termination of this agreement, and if any dispute shall arise as to the amount of the actual expenditure or the net cost for the purposes of this clause or the preceding clause either upon the completion or during the progress of the works or upon the termination of this agreement the decision of the Government of Bombay shall be final and conclusive.

6. In case any dispute shall arise between the Secretary of State or the Government of Bombay and the Firm as to the works and duties of the Firm or as to the interpretation of this agreement (other than the amount of the actual expenditure or net cost as provided for in the fifth clause) the same shall at the option of either of them be referred to an Arbitrator to be appointed by the Government of Bombay, whose decision shall be final and conclusive on all parties.

IN WITNESS WHEREOF the said Charles Scott Meik and Sir George Cunningham Buchanan have hereunto set their hands and the Honourable the Governor of

Bombay in Council hath caused one of the Secretaries to the Government of Bombay to set his hand and the seal of the said Government for and on behalf of the Secretary of State for India in Council.

SIGNED by the above-named Charles Scott Meik and Sir George Cunningham Buchanan in the presence of— (Sd.) GEORGE C. BUCHANAN.

Witnesses to Sir George Buchanan's signature.

(Sd.) F. B. BARIA,
Superintendent Development Department, Bombay.

(Sd.) S. P. GHEEWALA,
Assistant Superintendent, Development Department, Bombay.

SIGNED, SEALED AND DELIVERED by (Sd.) P. W. MONIE.

one of the Secretaries to the Government of Bombay in the presence of

(Sd.) JAYARAM JANARDAN MANTRI,
Superintendent, Development Department, Bombay.

Seal of Government.

(Sd.) D. D. BILLIMORIA,
Superintendent, Development Department, Bombay.

Signed by the above-named Charles Scott Meik in the presence of

(Sd.) R. H. MORRIS,
112, Wakehurst Road,
Clapham, S.W.,
Clerk.

(Sd.) C. S. MEIK.

(Sd.) J. A. JOHNSTON,
26, Queen's Road,
Wimbledon, S.W. 19,
Civil Engineer.

IV.—REPORTS OF SIR GEORGE BUCHANAN ON HIS VISITS TO BOMBAY, 1922-24.

16, Victoria Street,
Westminster, S.W.
11th February, 1922.

From

Sir GEORGE BUCHANAN, K.C.I.E.;

To

The DIRECTOR of DEVELOPMENT, Bombay.

Sir,

I beg to submit the following report on the progress of the Back Bay Reclamation Scheme, which received the general sanction of the Secretary of State in May 1920, my firm under agreement with the Secretary of State being appointed the Engineers.

2. My original report and estimate for the project was dated September 1919 and it will be convenient if in the first instance I briefly trace events from that date.

3. *Method of executing the works.*—In my report I recommended that :—

(*a*) The construction of the 4 miles sea wall be let by contract if a satisfactory tender were received.

(*b*) The Government of Bombay purchase the dredging plant and carry out departmentally the filling with dredged material of the area to be reclaimed.

4. On enquiries being made with a view to letting a contract it was ascertained that owing to the fluctuations in rupee exchange along with the steady rise in the price of machinery, materials and labour no contractor would tender on the pre-war basis of a fixed schedule of rates for finished work but contractors were willing to undertake the work on the basis of an approximate estimate, the Government supplying the funds and paying the contractor, for his work and skill, a percentage on the actual cost. This proposed arrangement was not considered satisfactory but as the work of construction was to proceed simultaneously from Colaba and Marine Lines it was believed more rapid progress might be made if a portion of the work were let by contract. Tenders were therefore invited on the percentage basis for the construction of 8,000 feet of wall from the Colaba end, but when received they were found to be without exception so unsatisfactory from both economic and technical points of view, that it was decided Government should itself carry out the whole work by direct purchase of machinery, materials and plant, employment of Engineers and workmen, and use of sub-contractors.

5. Under the rules of the Government of India for the carrying out of Public Works, the approval of my report, plans and estimates did not imply more than the accordance of administrative sanction to the scheme, and a detailed project estimate giving the fullest particulars under each head and sub-head should have been submitted before any actual expenditure was incurred.

The preparation of this estimate would have taken a staff of Engineers at least one year and when completed would have been valueless, for the same reason that contractors were unable to submit a firm tender, and as time was of importance it was decided to proceed in anticipation of sanction and to prepare the detailed project estimate as soon as reliable data had been collected.

Effect was then given to the recommendation in paragraph 47 of my report, the dredging plant, the railway rolling stock and machinery, and plant for the quarry and works yards was ordered, and work was begun in opening out the quarry at Kandivli, 21 miles from Bombay.

6. *Departure from the* 1919 *Project.*—Some changes have been made in the original programme involving in some cases an increase of expenditure. The principal alterations are :—

(1) In order to conform to military requirements the line of the wall has been brought nearer to the shore at the Colaba end and pushed out in the middle so as to retain the total acreage of reclamation.

(2) The wall at the Marine Lines under construction by the Public Works Department was completed about 1,000 feet short of the original proposal involving a corresponding increase in the length of the new wall.

(3) Under the orders of the Government the construction of the new wall is being proceeded with from both ends simultaneously instead of from one end as originally schemed, involving an increased expenditure in machinery and plant.

(4) Blocks of stone will be substituted for the 20 ton concrete foreshore blocks.

(5) In place of working the auxiliary dredger pumping plant by electricity it has been necessary for reasons given hereafter to provide a much more expensive steam plant.

7. *Delays in proceeding with the work.*—The time programme set forth in paragraph 46 of my 1919 report was on the assumption that the sanction of the Secretary of State to the entire scheme would be obtained by the 1st January, 1920, but as that assumption was not realised, the programme was necessarily modified. In February, 1921, I submitted an amended programme of operations and after describing in some detail the extent and nature of the preliminary works to be executed both at Kandivli quarry and in Bombay I observed that I confidently hoped to see the permanent works begun both at Marine Lines and Colaba on the 1st October, 1921, that being the date I expected the weather to be propitious, the preliminary work completed, and the quarry ready to deliver stones.

The completion of the quarry and other preliminary works depended largely upon the prompt arrival of the machinery and plant ordered from England and every effort was being made to push on the manufacturers and get prompt shipment of the goods by the India Office when the disastrous coal strike caused the suspension of nearly all work for several months and thereby once more upset our programme.

8. There has also been very considerable local delay :—

(1) Much time has been lost in getting delivery of machinery from the Bombay Docks.

(2) When clear of the Docks there has been serious delay in transport by rail and I am informed that on various occasions the Railway Company has taken 21 days to deliver goods to the quarry, being at the rate of 1 mile per day.

(3) The Boilers supplied for use on the works are made by the best makers in England and are accompanied by certificates issued by a Boiler Insurance Compay. At Home, these certificates would be accepted without question but under the Bombay Boiler Act every boiler used in the Presidency has to be rigorously inspected by an Officer appointed under that Act. There is no reasonable objection to this procedure if inspections were carried out promptly, but not only has there been great delay in inspection but the rules made in 1891 are now obsolete and details of construction and steam pressures used all over the world in the boilers provided are condemned in Bombay.

(4) There has been a great deal of sickness amongst the European Staff.

I am not in a position to say whether the delays under the heads 1, 2 and 3 were avoidable. I merely chronicle the facts.

We are now considerably behind our second programme but the Chief Engineer hopes to make up a certain amount before the break of the monsoon.

9. *Progress of the work in England—Plant and Machinery.*—Exclusive of the dredger a sum of approximately £300,000 has been expended on Plant and Machinery. This is not out of the way, taking all things into consideration, and a great deal of the plant will constitute a valuable asset at the completion of the works.

10. My firm was entrusted with the taking in of tenders and supervision of manufacture and the greater part of my time and of our staff has been occupied in that connection. We took trouble in every case to recommend to the India Office the lowest tender consistent with workmanship and design. The machinery with the exception of the quarry drilling plant, was obtained from British firms, as at that time works on the Continent were not yet recognised for the supply of machinery. We made, however, various enquiries in America and the Metropolitan Wagon Company of England who obtained the order for railway wagons, were £50,000 lower in their tender than the American firms.

11. *Purchase of Dredger and Pipe Lines.*—In 1919 I obtained from Messrs. W. Simon & Co., Ltd., a tender amounting to £410,454 for the provision of the dredger and auxiliary plant. The tender was on the basis of rates current for wages and materials, with the proviso that all advances on these rates should form an extra charge, at the same time Messrs. Simon & Co. offered to accept a total fixed price of £451,500 and take on their own shoulders the risk of further advance in the cost of labour and material. I also made arrangements with the Tata Electric Power Company to supply current for the working of the auxiliary dredger.

12. Unfortunately sanction to the purchase of the dredger was not received in time to take advantage of Messrs. Simon & Co.'s offer, which was only available for three months, and when the case was re-opened by the India Office in May 1920 and the order placed, the total amounted to over £650,000, an addition of £200,000, of which £100,000 was due to the fact that in 1920 the Tata Electric Power Company were unable to guarantee the supply of current, and an expensive steam auxiliary dredger had to be substituted for the electric plant.

Moreover, the estimate in 1919 was based on an exchange of Rs. 12 to a pound but with exchange rate at Rs. 15 to the pound the cost of the dredger works out at Rs. 110·62 lakhs compared with the original estimate of 50·6 lakhs.

13. It may be asked why the dredger was ordered when prices had increased so greatly, especially when the works are not sufficiently advanced for its immediate use. The answer to this very legitimate question is that it was considered necessary to order the dredger well in advance of actual requirements in order to ensure delivery.

It was impossible to foresee the collapse of the business boom and the resultant fall in prices and as there was at the time, and there is still, a world's shortage of dredgers, it was anticipated that there would be a long waiting list of orders in the hands of the Builders.

Another consideration which must not be overlooked is that a dredger usually has a somewhat perilous voyage across the ocean, and were it to be lost it is always advisable to have some time in hand to build another one.

14. The dredger " Sir George Lloyd " was launched on the 21st October and satisfactory pumping trials were carried out on the 24th November, 1921, speed trials were carried out on the 26th November, 1921, and as certain defects were noticed the vessel was sent back to the ship yard for some alterations. New speed trials were to be held on the 19th January the results of which have not yet come to hand.

The auxiliary dredger " Colaba " had not been tested at the date of the last report.

15. The Architects for the plant are Messrs. Sir J. H. Biles & Co. (the Consulting Naval Architects to the Secretary of State) with whom my firm has been associated.

16. *Progress of the work in India.*—The work has been divided into three sections :—

(i) Quarry.
(ii) Marine Lines.
(iii) Colaba,

and I will describe these sections separately.

The Chief Engineers's programme for this season's work contemplates the construction of 2,000 feet of finished wall from the Marine Lines end, and 2,000 feet of finished wall from the Colaba end. I have every hope that notwithstanding the delays which have occurred, the programme will be completed ; if there had been no delays the programme could have been materially exceeded.

17. *Quarry Section.*—This is situated near Kandivli, a station 21 miles up the B. B. and C. I. Railway where we were fortunate in finding a hill 250 feet high of solid Trachite ; an output is being aimed at of 2,000 tons or more per day a considerable proportion of which will be in solid blocks up to 15 tons weight each, and for such a size and tonnage very considerable works have had to be executed, of which the following constitute the principal items :—

1. Laying the Railway Siding to connect the quarry with the B. B. and C. I. Railway main line.
2. Housing of staff and employees aggregating several thousand people.
3. Construction of a Power House to supply power to the Air Compressors for drilling purposes and erection of workshops and stores for the repair, maintenance and working of the extensive plant.
4. Provision of a water supply to give 50,000 gallons per day, involving the collection of water from wells scattered at considerable distances and pumping to a service reservoir.
5. Erection of steam cranes, steam derricks, stone crushers, Locomotives and other machinery.
6. Preparation and levelling of quarry floor.

18. The work was taken in hand about the beginning of 1921 and carried on throughout the monsoon. The difficulties to contend with were numerous and were aggravated by a severe epidemic of malarial fever which reduced the working efficiency of staff and employees.

The operations may now be said to be practically finished and I have no hesitation in stating that the results reflect the greatest credit on the Chief Engineer Mr. Lewis, and the Senior Deputy Chief Engineer Mr. O'Rorke who has been the officer directly in charge.

19. If I were to make a criticism it would be that the works are too good and of too permanent a nature for merely supplying stone in connection with the Back Bay Scheme. On the other hand it pays to house well your staff and employees and to put rain-proof buildings over good machinery and if, as anticipated, the quarry is made a permanent source of supply for Bombay, the expenditure is fully justified.

20. *Marines Lines.*—The preliminary works comprised the laying of railway sidings, erection of cranes, concrete mixers, pile drivers and other machinery, small workshops and stores, and staff quarters. On completion of the above the construction of the timber temporary gantry was taken in hand, the purpose of the gantry being to provide accommodation for wagons of rubble stone conveyed by rail from Kandivli quarry, the contents of the wagons being tipped from the gantry to the site of the wall. By this means a solid rubble mound will be formed from ground level to high water mark and on the mound will be constructed a concrete superstructure to a level of 9 feet above high water. The rubble mound will be potected from sea attack by heavy stone blocks laid on the outside.

The building of the gantry began early in December and up to the end of January 119 piles had been driven and 476 feet of gantry finished.

21. I regret that I cannot feel satisfied at this performance as even making all allowances for time lost in training men, I think that with the machinery provided half as much again should have been completed in the time.

It is fair to say that there has been an improvement during the last weeks which, if maintained, will possibly permit of the season's programme being carried through.

22. *Colaba.*—My original plan provided for a mass concrete wall 16 feet thick at the base and 12 feet thick at the top for the first 2,000 feet and thereafter the design corresponded with that already described for Marine Lines. Subsequently it was proposed to build a concrete block wall 16 feet thick and 8,000 feet long before following

the Marine Lines type, but finally we reverted to my original design for a mass concrete wall.

23. In all the schemes for the reclamation of the Back Bay, stress has been laid on the necessity for a particularly strong wall to resist the severe sea attack and our plans were made accordingly.

I have now had the advantage of living for two months on the works at Colaba and I have come to the conclusion that for the 10,000 feet of wall situated on the reef, the sea attack will be negligible because, however great the storm, there will be immense protection afforded by the reef itself outside the wall.

I have personally explored the reef from end to end and I find that it constitutes not one but many break-waters which will reduce the biggest waves into froth and spray. As a proof thereof numerous flimsy rubble walls built for use as fishtraps may be seen scattered over the reef, resisting the whole force of the monsoon year after year without repair.

24. We have now reduced the thickness of the mass concrete wall from 16 feet to 12 feet and a still smaller section would be sufficient were it not there must be sufficient width to take a line of rails along the wall for construction purposes or alternatively build special staging. Moreover from 2,000 feet to 10,000 feet we have in consultation with the Chief Engineer, Reclamation Department, decided to dispense with the timber gantry and build the wall by wall by means of an ordinary tip from end tipping wagons and we shall probably materially reduce the size of the concrete superstructure.

25. At Colaba the preliminary and temporary works comprise the erection of machinery, laying of tram lines, railway connection along the foreshore to Marine Lines, collection of stones on the reef for the mass concrete wall, and provision of quarters and lines for employees.

The work was delayed owing to the severe illness of the Deputy Chief Engineer, but by the 31st of January 650 feet of wall foundation had been completed, and I see nothing to prevent completion by the end of May of the 2,000 feet contemplated in the programme as the work is now proceeding in a thoroughly satisfactory manner.

26. *Programme of future operations.*—I understand that there are cogent reasons for pressing ahead with the completion of the scheme from the Colaba end even at the expense of progress at Marine Lines.

The only temporary work of any importance now outstanding at Colaba is the construction of the broad gauge railway connecting Colaba with Marine Lines, thereby enabling whole trains of stone from Kandivli to be transported direct to Colaba. This work is about to be put in hand, and once it is completed and the necessary terminal arrangements made at Colaba for the automatic transfer of stone from side to end tip wagons, wall construction from the Colaba end can proceed at full speed, and in my opinion can be continued throughout the monsoon. There are about 150 trains of stone required for the rubble mound or at 45 trains a month say 3½ months to complete the 8,000 feet on the reef, which, with the 2,000 feet of concrete wall now under construction, will make a total of 10,000 feet of wall or nearly half the entire length.

On completion of the rubble mound the building of the concrete superstructure will be put in hand, but that need not hinder the deposit of pump filling, and the dredger can begin operations as soon as the rubble mound is sufficiently advanced and the cross wall put in.

27. It is impossible to fix a date for starting the dredger. Had it not been for the delays in beginning the work this season, I am of opinion that wall construction would have advanced sufficiently to make it worth while beginning the dredging operations at the end of the current year, and this possibility should still be kept in view and one pipe line laid across the peninsula in order to be ready for eventualities.

In any case, the whole of the 10,000 feet of wall from Colaba end, including the superstructure, should be finished by May, 1924, and the dredger begin work in that section about October, 1923.

The wall from Marine Lines should advance at the rate of 3,000 feet per annum and join up with the Colaba wall in the spring of 1925. But it may be desirable to keep open a gap until the dredger is ready to operate in the Marine Lines section.

28. To fill the entire area enclosed by the wall requires six seasons' dredging or, say, up to the end of May, 1929, on the supposition that the dredger begins in 1923 and the work continues without a hitch. That does not, however, mean that land would not be available for occupancy until that date, because by some additional expenditure on cross bunds every season or two seasons work can be isolated and completed. Much depends on the nature of material dredged, and that can only be definitely ascertained when actual dredging begins.

29. *Engineering Staff.*—In carrying out a large public work departmentally success, both economic and technical, depends to a large extent upon the adequacy, efficiency, and loyalty of the engineering staff, technically because apart from actual design much depends upon workmanship, and economic because the spending of money and the employment to the best advantage of workmen is entirely in their hands.

Government is in regard to its staff at a disadvantage compared with a contractor or a private firm. The loyalty and enthusiasm of a staff is often taken for granted, but it is rarely spontaneous, and in the case of a contractor or private firm bonuses are given for particularly good work, and in other ways officers are encouraged to do a great deal more than is strictly required of them; also on the converse side if an engineer is inefficient a contractor will cut his losses and get rid of a man by paying whatever is legally due in lieu of notice. Government rules preclude either bonuses or pay in lieu of notice, and I merely mention this matter because it is one of the chief advantages gained in employing a contractor for the execution of public works.

30. Under section 3 of the agreement with my firm we nominated for the offices of Resident and Deputy Resident Engineers respectively Mr. L. W. Lewis, of the Government of India, Public Works Department, and Mr. G. O'Rorke, their titles being subsequently changed to Chief Engineer, Reclamation Branch, and Senior Deputy Chief Engineer.

The Chief Engineer deals with works of reclamation other than the Back Bay Scheme, but the Senior Deputy is at present engaged solely on that work and is at present in charge of the quarry at Kandivli.

In addition to the above there are two Deputy Chief Engineers in charge of the Colaba and Marine Lines sections of the works respectively, and each of these has an Assistant Engineer attached to his section. There is also an Assistant Engineer at the quarries.

31. I doubt very much if the staff is adequate; the Assistant Engineers are not sufficiently trained to act, if required, for the Deputy Chief Engineers, and in case of one of these officers falling sick or going on leave, the work must suffer. A case in point occurred recently at Colaba when just at the beginning of the working season the Deputy Chief Engineer was absent in Hospital for some weeks, and when the Chief Engineer goes on leave this year and the Senior Deputy Chief Engineer acts for him, a chance casualty amongst the remaining staff might prove very serious from the point of view of works progress and works economy. On large public works involving great expenditure it is more economical to be rather overstaffed than the reverse, and in the East provision must be made for casualties.

32. I recommend the appointment of at least one additional Engineer, with experience in marine works, of the Executive Engineer's grade who would be posted wherever his services were most required, and who would be available to act at any time as a Deputy Chief Engineer. I think this officer should be a European because it is almost impossible to obtain an Indian Engineer with marine experience, and there is a larger field for selection amongst Europeans.

I also make the suggestion, for what it may be worth that, as is done on large works in Europe, each Deputy Chief Engineer might have attached to his staff on a nominal salary a young Indian Engineer specially selected, who would be given the opportunity of obtaining practical experience of the works.

33. *Engineering Accounts.*—In addition to an efficient Engineering staff the success from the point of view of economical execution of a work carried out departmentally depends upon the proper keeping of accounts.

As previously stated the practice in India is to have a project estimate prepared by the Engineers and sanctioned by competent authority before the work is put in hand, and this project estimate and subsequent works estimates are placed in the hands of the Government Accounts Department who, through their auditors scrutinize all statements of expenditure submitted by the Engineers, and check each item against the sanctioned head of account, at the same time furnishing the Engineers with debits of various kinds which may have not reached them at first hand.

An Engineer is not thereby absolved from the responsibility for his accounts but the check acts as a safeguard, because any irregularity or excess on a head or sub-head of the estimate should be brought promptly to his notice by the receipt of an objection statement.

The Engineer's accountant although under his orders is appointed by the Accounts Department and much depends upon his qualifications.

A good accountant should be more than a mere recorder of figures. He should be able to assist the Engineer by the analysis of cost under many sub-heads which do not necessarily appear in the project estimate.

34. The practice in England differs from that which obtains in India. Works are sanctioned on estimates to which in India only administrative sanction would be given, but whether the works are executed by contract or departmentally the Engineer has to be in close touch with costs from day to day, from beginning to completion of the works, and by means of a competent accounts staff and a reliable system of cost keeping as differentiated from account keeping, the Engineer knows exactly where there has been excess on the smallest sub-head of his estimate or where money has been saved.

Both Indian and English systems have their good points and that in India is the result of many years' experience. I have worked with both and venture to suggest that a weak point in the Indian method is that works accountants are frequently not more than figure recording clerks, and when as a member of the Indian Munitions Board I was in control of the Indian Ordinance Factories, we entirely reorganized the accounts system, with the co-operation of the Accounts Department, and in each factory accountants receiving perhaps Rs. 100 to Rs. 150 per month were replaced by Indian accountants of much more experience and receiving 3 and 4 times the pay who were capable of assisting the Superintendents in practical cost analysis.

35. My excuse for writing at length on this subject apart from its general importance, is that the accounts of the Back Bay Scheme do not appear to be kept on either one or the other of the systems described above. Although works estimates have been made, there is as yet no sanctioned project estimate. The Chief Engineer keeps no accounts nor has he been furnished with up-to-date statements of expenditure by the accounts branch in order that he may see how matters stand. In this connection I wrote to the Chief Engineer on the 7th January, asking to be supplied for the purpose of this report, with a statement in some detail giving the total expenditure on the project up-to-date or reasonably so, the Chief Engineer asked the Accounts Department for the information and on the 21st January I received a statement of expenditure up to the end of October, which can hardly be called up-to-date nor did it contain sufficient detail to be of any practical use.

36. The accounts are kept on what is known as the pre-audit system which means, as the name conveys that no payments are made until the accounts have been audited, and one of the chief recommendations for the system is that the audited accounts are supposed to be always written up-to-date.

Under such a system there is no object in the Chief Engineer keeping account books, but it is of the first importance that he should be furnished at least once a month with an up-to-date statement of expenditure on all heads of account, whilst each Deputy Chief Engineer should be able to rely upon a current audit and the prompt supply of all debits against his estimates.

37. *Revised Estimate.*—The estimate accompanying my 1919 report amounted to lakhs 367·61 at Rs. 12 to the pound sterling and this sum was increased by the Government to 4 crores.

The estimate was based on the most reliable figures obtainable and no one could forecast either the tremendous upward bound in prices, or the depreciation in the value of the rupee. To give one example typical of many steel plates and angles which were £18 per ton in September 1919 rose to £24 10*s.* per ton in May 1920 and remained at that figure until the end of the year, during which period the bulk of the material for the dredger and other plant was purchased.

The price of labour rose in proportion both at Home and in India, and in Bombay in particular the Engineers inform me that labour both as regards cost and efficiency compares unfavourably with other parts of India.

38. In the 1919 estimate I assumed that the work of constructing the wall would be let by contract, and that the contractor would purchase the plant necessary and carry out all temporary works, but in the revised estimate I have included separate items on this account under the various main heads and I have included quarry as a main head.

Under the sub-head moorum for surface filling the area to be covered has been reduced because at a conference in London with Mr. Davidge, the Town Planner, it was agreed that laying moorum over land ultimately to be covered with buildings was an unnecessary expense.

Under the head dredging, cost of plant has been kept distinct from working expenses, and the purchased price of the dredger " Kalu " and the cost of the pipe line which had not been arranged for in 1919 has been added to the plant.

Under the head, roads, lights and drains the original Public Works Department estimate in 1912 was 59·45 lakhs, which was increased by me in 1919 to 75 lakhs. In neither of these estimates was any allowance made for sewering the reclaimed area, as it was believed this would be done by the Municipality. I understand that such is not the case and also that Municipal rules demand better roads than those originally provided. I have therefore increased the estimate under this head to 135 lakhs.

39. The total revised estimate of gross cost at Rs. 15 to the pound amounts to Rs. 668·89 lakhs, as per appended statement, but it is obvious that this sum does not represent the real cost of the work, as there are considerable reductions to be made on account of the capital value of the dredger, the quarry and the plant and machinery at Marine Lines and Colaba when the Back Bay Scheme itself is completed. The dredger may be used on other works or sold, whilst as already pointed out the quarry will be a valuable asset for many years to come, will supply stone for East Colaba wall and other works, and stone for the buildings to be erected on the reclaimed area. It is impracticable at the present time to put a final value on the above, but the Chief Engineer and I agree that 70 lakhs is a reasonable minimum sum and therefore that sum has been deducted from the gross amount of estimate which brings the nett cost to Rs. 598·89 lakhs.

40. *East Colaba Reclamation.*—My estimate in September 1919 for this work was Rs. 39·76 lakhs, and in May 1921 the Chief Engineer, Reclamation Department, sent my firm for criticism a copy of the preliminary estimate prepared by him amounting to Rs. 71·07 lakhs.

In a letter dated 18th July 1921 we replied to the Chief Engineer and stated that the prices were higher than we had experienced on other works we had carried out. We made certain proposals and suggested that I should go into the matter fully when I next visited Bombay as it was difficult in a letter, without knowing more of the circumstances to discuss the merits of the respective proposals. This letter crossed a letter dated 20th July from the Chief Engineer saying that he had reduced his estimate to 46·71 lakhs and giving reasons for so doing.

I understand that the position now is that the Chief Engineer has been asked to supply a detailed project estimate and on its completion we will go into the matter further.

41. *Conclusion.*—Although the delays in beginning the work have been most regrettable and valuable time has been lost I am well satisfied with the future outlook. The difficulties inevitable when commencing a large engineering work have been overcome and there is so far as we can see a straight road ahead.

Wall construction will be easier and speedier than I anticipated, and the only uncertainty concerns the exact nature of the material to be dredged from the harbour and used as filling.

In my opinion there should now be a concentration on the following :—

(1) Railway connection between Colaba and Marine Lines.

(2) Preparation of terminal arrangements at Colaba and purchase of end tipping wagons.

(3) On completion of Nos. 1 and 2, construction of stone mound to a distance of 10,000 feet from Colaba and cross bunds as required.

(4) Erection of dredger's floating pipe line and laying of the land pipe line for the dredger to serve that area.

42. I have in this report expressed my opinion freely on all points conceiving it my duty so to do in view of paragraph 1 of our agreement which says that:—

" The firm shall at all times assist and advise the Government of Bombay in all matters relating to the execution of the works."

I have the honour to be,

Sir,

Your most obedient servant,

(Signed) GEO. C. BUCHANAN.

Bombay, 11th February, 1922.

BACK BAY RECLAMATION SCHEME.

REVISED ESTIMATE (1922).

Item.	Description.	Unit.	Quantities.	Rate.	Lakhs of rupees.	Lakhs of rupees.
1	*Kandivlee Quarry*—					
	(*a*) Land acquisition, Railway sidings, cooly Lines, water supply and other miscellaneous works.	—	—	—	20·13	—
	(*b*) Power House, Workshop and Equipment.	—	—	—	7·03	—
	(*c*) Crushing Plant	—	—	—	4·20	—
	(*d*) Staff Quarters	—	—	—	2·00	—
	(*e*) Cranes, Derricks, Locos., Skips, Engine Shed, &c.	—	—	—	10·49	—
	(*f*) Drilling Plant	—	—	—	·88	—
	(*g*) Establishment during construction	—	—	—	1·18	—
						45·91
2	*Railway Rolling Stock*	—	—	—	—	30·00
3	*Marine Lines* (11,500 *Lin. ft.*)—					
	Temporary works, Tools and Plant ...	—	—	L.S.	23·69	—
	Gantry	—	—	—	—	13·60
	Tipped rubble	%C. ft.	68,500	14	9·59	—
	Mass concrete wall	%C. ft.	10,900	150	16·35	—
	Parapet	—	—	—	2·40	—
	Pitching	—	—	—	4·40	70·03
4	*Colaba* (10,000 *Lin. ft.*)—					
	Temporary works, Tools and Plant ...	—	—	L.S.	10·00	—
	Railway to Marine Lines	—	—	,,	7·81	—
	Mass concrete wall (2,000 ft.) ...	—	—	—	10·00	—
	Tipped rubble	%C. ft.	29,585	14	4·14	—
	Mass concrete wall	%C. ft.	7,520	150	11·30	—
	Parapet	—	—	L.S.	2·10	—
	Pitching	—	—	,,	2·90	48·25
5	*Paving trap stone on whole wall*	—	—	—	—	6·20
6	*Dredging Plant*					
	Cost of dredger "Sir George Lloyd" and equipment.	—	—	—	110·62	—
	Cost of dredger "Kalu" and pipe line	—	—	—	17·76	128·38
7	*Moorum Topping*	%C. ft.	10,000,000	6	—	60·00
8	*Pumping and filling*—					
	Material	C. yds.	25 million	5 As.	78·12	—
	Cross walls	—	—	—	7·00	—
	Pipe lines, trenching and laying ...	—	—	—	10·00	95·12
9	*Roads, Lights, Stormwater drains and Sewerage.*	—	—	—	—	135·0
10	*Establishment*	—	—	—	—	25·00
	Add for unforeseen circumstances ...	—	—	—	—	25·00
						668·89
	Deduct recoveries for value of Quarry, other Machinery and dredger.	—	—	—	—	70·00
				Net cost of	project ...	598·89

Appendix to my report of this date.

(Signed) GEO. C. BUCHANAN.

Bombay, 11th February, 1922.

Bombay, dated 10th January, 1923.

From

SIR GEORGE BUCHANAN, K.C.I.E.,

Bombay;

To

THE DIRECTOR OF DEVELOPMENT,

Bombay.

Dear Sir,

I beg to submit the following report on the progress made with the Back Bay Reclamation Scheme.

2. In my report dated 11th February, 1922, I described the action taken up to date under the various heads, and said that the programme of permanent work for the season 1921-22 contemplated the construction of 2,000 feet of finished wall from the Marine Lines end and 2,000 feet of finished wall from the Colaba end. I discussed the programme of future operations, and the reasons for pushing ahead the work at Colaba even at the expense of progress at the Marine Lines, and to that end I urged a concentration on the work of building the Marine Lines-Colaba Railway along with the necessary terminal arrangements at Colaba for the transfer of stone from side tip to end tip wagons.

In the matter of dredging I said that although I could not definitely fix a date for beginning operations, the possibility of dredging in 1922-23 should be kept in view and a pipe line laid across the Peninsula in order to be ready for eventualities. Lastly I made some observations on the necessity for strengthening the Engineering Staff and for the keeping of Engineering Cost Accounts.

Work Accomplished.

3. The 2,000 feet length of mass concrete wall at Colaba was completed by September, 1922, and 2,050 feet of rubble and 1,850 feet of concrete wall at Marine Lines was completed by June, 1922. The Marine Lines-Colaba Railway and terminal transfer station are practically completed but no action has been taken towards laying the first pipe line across the Peninsula.

It is matter for great regret that the work of constructing the Marine Lines-Colaba Railway was not begun until the month of May, instead of February, which was the date of my report, as three precious months were lost at the best working time of the year with a corresponding delay at the beginning of this working season.

Programme of Wall Construction.

4. The wall will be 21,578 feet long; 10,500 feet of rubble mound from Marine Lines is being built from a timber gantry whilst the 11,078 feet from Colaba is as regards 2,000 feet, a mass concrete wall, and for the remainder a similar rubble section to Marine Lines but built by means of end tipping wagons dumping ahead instead of side tipping wagons from the gantry.

According to the programme drafted by my firm in April 1921 wall construction was to begin in October, 1921, and the wall was to be completed by 31st May, 1925. The Chief Engineer, Reclamation Department, in his Project Estimate, dated October 1922, did not see his way to finishing the wall until 1926, but he has since revised the date and the following is his latest programme :—

	1921–22.	1922-23.	1923-24.	1924–25.	Total.
	Lin. ft.	Lin. ft.	Lin. ft.	Lin. ft.	Lin. ft.
From Marine Lines	2,000	3,000	3,000	2,500	10,500
From Colaba	2,000	4,500	4,578	—	11,078
Total ...	4,000	7,500	7,578	2,500	21,578

From above it will be seen that it is proposed to construct this season 3,000 lineal feet of finished wall from the Marine Lines end, 4,500 feet from the Colaba end and one cross wall 3,000 feet long and the following table supplied to me by the Chief Engineer, Reclamation Department, shows details of the stone required.

Back Bay Reclamation Scheme—Programme 1923.

	Length of wall to be built.	Quantity of rubble.	Quantity of protection stone.	Quantity of crushed stone for concrete.	Total quantity of stone required.	Total quantity in number of wagons.
	Lin. ft.	Tons.	Tons.	Tons.	Tons.	
Marine Lines	3,000	53,034 Mid.	19,955 April.	10,711 May.	83,700	4,185
Colaba	4,500	56,156 End	25,181 April.	15,500 August.	96,837	4,844
Cross wall	3,000	52,090 End	— July.	—	52,090	2,605
					232,627	

233 Trains, say 240 at 12 per week = 20 weeks work.
Work to start in full on 1st January, 1923.

Probability of completing this season's Year's Programme.

5. At the date of this report the position is as follows :—

At Marine Lines the driving of the piles for the gantry has reached chainage 4,300, leaving 700 feet to complete the 3,000 feet and 2,880 tons of stone have been tipped on the new length of wall. At Colaba tipping from end tipping wagons has not yet begun but a start is expected very shortly.

The output of the Quarry according to the report accompanying the Chief Engineer's Project Estimate is 2,000 tons per diem, or considerably in excess of what is required, so that theoretically there should be no difficulty in carrying out the work, but it must be remembered we are already three months late in starting the season's operations. The Chief Engineer has only allowed in his programme for one cross wall at Colaba, 3,000 feet long, but it is of great importance to build also the cross wall 1,500 feet long opposite Church Gate Street so that the reclamation of the Marine Lines Area by means of the Dredger " Kalu " may be taken in hand this year.

Opinion of Work Executed.

6. The work carried out up to date is substantial, and I am satisfied that the wall as designed by my firm will be solid enough to withstand the force of the strongest monsoon waves. The settlement of the mass concrete wall on the rubble mound at Marine Lines has been less than was anticipated, but there is room for considerable improvement in the workmanship, as, due probably to defective bracing of the shuttering, indicative of inadequate subordinate supervision, the line is not true. The strength of the wall is not affected and the coping will hide the defect, but it is not first class work, and if done by a contractor would not be accepted.

A more serious matter concerns the quantity of stone used in the mound. I requested the Deputy Chief Engineer to have some sections taken in order to see how the wall conformed with the drawing, and I find that the quantity of stone on the outer slope is in excess to the extent of about 50 per cent. In actual figures about 60,000 cubic yards have been deposited as against about 40,000 required which, reduced to money, means that the 2,000 feet of rubble mound has cost Rs. 75,000 more than it need have done. It is usual in a work of this kind for Cross Sections to be taken periodically to check the line of the slope and if this is not done the amount of stone may be in deficit to an extent to endanger the wall, or in excess to an extent greatly unnecessarily to increase the cost.

It is also of importance that the stone despatched from the Quarry should be as large as can be reasonably obtained. The procedure at the Quarry is to do a great deal of the work of loading the wagons by hand labour. This is cheap and fairly speedy, and can be used for the considerable percentage of small stone (probably 50 per cent.) brought down by every blast. What we do *not* want, however, is for stone to be broken up specially in order to suit hand labour. We want what is known as the " Run of the Quarry," big and small, just as they come. To do this it may be necessary to alter the layout so as to bring both cranes and wagons nearer the Quarry face and, if necessary, this should be done.

I find that in many cases the wagons are not being fully loaded at the Quarry, thus delaying the work and increasing the cost of the transport of the stone. The wagons were designed to carry 20 tons at 20 cubic feet to the ton, but the stone has proved lighter than was anticipated, and rubble runs to 27 cubic feet to the ton, therefore a 20 ton wagon only carries about 15 tons of stone, but measures are being taken to remedy this defect by increasing the height of the sides.

I examined a train of stone recently containing 44 wagons, some of which had had their sides raised, and the total weight of stone contained in the wagons was 576 tons, or 13 tons per wagon. One wagon contained only one stone weighing 1 ton, that is to say the cost of transport of that one stone was 20 times in excess of the estimate.

Dredging.

7. The successful reclamation of the enclosed area by means of pumping material dredged from the sea bed is the crux of the whole scheme. The sanctioned project provides for the dredging of material from the Harbour and pumping it through pipe lines laid across the Colaba Peninsula, but since that arrangement, the Harbour Authorities have curtailed considerably the area hitherto believed to be available, the portion cut off containing according to the borings, the most suitable material. It was therefore decided last year to investigate the possibilities of obtaining good material from Back Bay itself in order to supplement the Harbour supply and more especially for the Marine Lines end of the work, where the lead from the Harbour would be very considerable. Some borings were taken and the result seemed to the Chief Engineer, Reclamation Department, sufficiently favourable to warrant a more complete testing of the ground and that is now in course of execution. Personally, although I should welcome a supply of good material from Back Bay and believe that the Marine Lines area can be reclaimed therefrom by the dredger "Kalu," I doubt very much from the nature of the borings already taken, whether there will be a sufficient depth of dredgable clay to warrant the use of the large dredger, there are also considerations of navigation to consider and the effect the deepening of the sea bed may have an increasing wave action. Lastly I understand there are five or more cables of the Eastern Telegraph Company laid across Back Bay and these must be collected and localized.

For the above reasons, whilst agreeing that full investigation should be made of the Back Bay Area I am averse to delaying the arrangements already made for dredging from the Harbour. In the programme of work drawn up by my firm in April 1921 we fixed the date for beginning dredging and filling at Colaba for December 1922 and I still consider that it should have been possible to be dredging this season.

The Chief Engineer, Reclamation Department, in his Project Estimate, fixed the date for the end of 1924 and the completion in 1929-30 but has since agreed to make an effort to dredge towards the end of the current year. There should be no doubt at all about beginning this year, and with two Dredgers, the large one pumping from the Harbour and the small one from Back Bay, I believe it possible to complete dredging during the season 1926-27. If however, no action is taken in laying the first pipe line until all the borings in Back Bay have been made, and the results tabulated and considered, I am afraid another season may pass without the dredger getting to work.

I also recommend that very early action be taken in putting the dredger "Kalu" into working order and arranging for any additional pipe line and a terminal pontoon if such are required.

In a recent memorandum I recommended the appointment of an Executive Engineer in charge of dredging, but on reconsideration I consider the work of such importance that I am of opinion the appointment should be that of Deputy Chief Engineer, if an Officer with the necessary experience can be obtained.

Cross Wall.

8. The Chief Engineer, Reclamation Branch, has allowed for eight cross walls against our four, the amount of stone involved being equivalent to that required for the whole of the sea wall. Until the nature of the material dredged is actually seen, it is impossible to say how many walls will be required and it may be necessary to divide the area into still smaller sections, but I hope by using murum in conjunction with stone a saving in the latter may be effected.

Staff.

9. The work both at Marine Lines and Colaba has I am afraid suffered from lack of supervision and competent Engineering Assistance, effect has now been given to the recommendation made in paragraph 32 of my report dated 11th February 1922 for the appointment of an additional Engineer and the officer arrived last month. He should in my judgment be posted to the Colaba Section under Mr. Billinton as that is where he could at present be of the greatest use and in case of need he is capable of acting for either of the Deputy Chief Engineers.

Accounts.

10. Action is being taken on the recommendations contained in paragraphs 33, 36 of my report dated 11th February 1922. An assistant has been appointed to assist the Deputy Chief Engineer, Quarries and an Accounts Officer of the Government of India has been deputed to consider the whole question with a view to giving assistance to the Deputy Chief Engineers, Colaba and Marine Lines.

If this can be arranged I am satisfied that considerable economies in carrying out the work can be effected. It is not sufficient to keep within the Project Estimate, as I consider some of the rates in that estimate are too high and could be reduced in practice, and to give one example of the use of costs if the Deputy Chief Engineer, Marine Lines, had been analysing his costs he would have ascertained that too much stone was being placed in the rubble wall.

General Remarks.

11. Speaking generally, I am of opinion that the works have made fair progress considering the difficulties experienced, and the shortness of staff but I doubt if there is sufficient planning ahead, and Co-operation between the Chief Engineer and the Deputy Chief Engineers. If the latter are not kept fully informed as to the general programme of the work it makes it very difficult for them to look ahead in their plans and arrangements, conferences held at frequent intervals are of great benefit to works under construction, and promote mutual confidence among the members of the senior staff.

The Engineer in charge, must of necessity look many months ahead of the work and cannot spare the time for daily details. The Deputy Chief Engineers in their turn must also spend part of their time preparing the work a few weeks ahead and the Assistants confine themselves to the daily routine duties.

In particular the Annual Programme of work should be worked out in the greatest detail in close conference with the officers concerned, otherwise, smooth working is impossible.

12. As informed you verbally I am leaving for England on the 20th instant returning to Bombay about the first week in July as I am anxious to see Back Bay under Monsoon conditions.

I am, Dear Sir,
Yours Faithfully,
(Signed) GEO. C. BUCHANAN.

BACK BAY HOUSE,
Colaba, dated 26th July 1923.

From
SIR GEORGE BUCHANAN, K.C.I.E.,
To
THE CHIEF ENGINEER,
RECLAMATION BRANCH,
DEVELOPMENT DEPARTMENT.

Dear Sir,

With reference to my inspection of works and conference with you on various points I have the following observations to make.

Colaba.

(1) You are considerably behind-hand in your programme for the year but this is largely accounted for by the shortage of output at the Quarries which again was caused in your opinion by the outbreak of plague at Kandivlee and subsequent shortage of labour.

In any case you should complete the programme during the monsoon and the next season's work will not be affected.

(2) There is more small stone in the mound than I like to see, but you have a good outside line of protection by large stone and it is agreed that for next season's work the Quarries will be instructed that stone below a certain fixed weight is not to be despatched for deposit on the wall.

(3) I enclose a copy of a letter and sketch cross section received from Mr. O'Rorke when he was acting Chief Engineer. We discussed the matter at Home and now with you and it is understood Mr. O'Rorke's proposal is approved.

(4) Next season, if there is any likelihood of stone output being short, I am strongly of opinion it would be better to curtail the length of the mound in order to consolidate in the rear and complete the concrete wall before the advent of the monsoon, as the mound *minus* the Concrete wall and with no large stones on the inside slopes suffers considerably from the monsoon seas. Also the large quantity of protection stones can be placed by the Crane travelling on the wall and the work thus rendered secure.

(5) You have shown me that the present level of the top of the mound is really a little too low as waves even in the fair weather top the mound and wash out small stones thus destroying the temporary track. I see no objection to raising the mound level two to three feet. More stones will be used but this will be compensated for by the saving in concrete, in time, and the wear and tear of plant.

Marine Lines.

(6) The season's work is complete with the exception of the protection stones to be set by the 20 ton Crane. The work is substantial and reflects credit on the Engineers in charge, but as at Colaba a good deal of the stone is on the small side. No time should be lost in finishing the protection pitching with the 20 ton Crane and next season, I hope, all the protection work will be finished before the break of the monsoon or alternatively the length of work curtailed.

Storm Water Drain and Cross Bunds.

(7) We sent you out our design for above along with our idea as to the method of construction.

You propose an alternative method and as you are carrying out the work you must exercise your own discretion especially as no principle is involved.

(8) In the matter of Storm Water Drains and Bunds at Colaba and Marine Lines respectively which enclose the first area to be reclaimed by dredgers, I have proposed to move the bunds to one side of the drains instead of immediately over them, as otherwise, I see no prospect of completing the bunds in time to begin dredging in say November. I understood you agree to this procedure and the work should be pushed forward with all possible speed.

Dredging.

(9) It is understood that the scheme put forward in our letter dated 3rd May 1923 and shown on Drawing No. 3411, dated 2nd May, will be adopted and we hope that the additional length of pipe line and renewal parts for the " Kalu " will be out in time for both the Dredgers to do good work in the coming season.

(10) In Mr. Brims, the officer selected by us to take charge of dredging operations, you will have an Engineer of great experience and we suggest that he should have a fairly free hand and be made responsible for everything connected with dredging, *i.e.*, control of dredgers and Dredging Masters, Laying of pipe lines, indenting through you for all stores required on Dredgers or elsewhere and generally in consultation with you the making of all necessary arrangements.

He should also be responsible for keeping the cost of dredging and should give you periodical reports and cost statements of which we should like copies. Mr. Brims should be provided with quarters on the works.

East Colaba Reclamation.

(11) I notice that a certain amount of work has been done and stone deposited but it is understood that at the present time work is to be concentrated on finishing the season's work at Colaba including the two cross walls at Colaba and Marine Lines respectively. I brought out with me Drawing No. 3435, dated 23rd June showing the section we propose for the East Colaba Wall.

You observe that for the same reason you wish to raise the level of the mound at Colaba you would like to raise the level of the stone on our section and to this I have no objection. I also agree that the concrete pavement might be of tar macadum.

We have discussed the Storm Water Drains across the area reclaimed and they present no difficulty.

(12) I consider that notwithstanding the shortage of output at the Quarries which has most seriously interfered with the completion of the Colaba Section, good progress on the whole has been made with the work since my last visit and we should like a special effort made to have the cross bunds finished, pipe lines laid and dredging begun in earnest at the end of the monsoon.

Yours faithfully,

(Signed) GEO. C. BUCHANAN.

(Through the Director of Development.)

Bombay, 14th February, 1924.

From

SIR GEORGE BUCHANAN, K.C.I.E.,

To.

THE DIRECTOR OF DEVELOPMENT, BOMBAY.

Dear Sir,

I beg to submit the following report on the progress made with the Back Bay Reclamation Scheme.

WORK EXECUTED.

Sea Wall.

At the close of last season's operations the gantry at Marine Lines had reached Chainage 5,100 feet. Work was renewed on the 22nd October 1923 and by the 22nd December 1923 the total length was 6,550 feet which concluded the season's work on gantry construction. Tipping stone to form the rubble mound was begun on the 1st December at chainage 5,030 feet, was completed to chainage 5,920 feet on the 11th February and is expected to reach chainage 6,450 by the 7th March. The concrete superstructure was finished to chainage 5,000 feet on the 11th June 1923 and will begin on the new length about the 18th February and finish to chainage 6,450 about the middle of April.

At Colaba the rubble mound from chainage 2,000 to 5,705 was finished on the 28th August 1923, concreting on superstructure began on the 30th August and was completed on the 28th December 1923. Work on the rubble mound was renewed from chainage 5,705 feet on the 10th December, had reached chainage 7,800 feet on the 11th February 1924 and is expected to complete to chainage 11,978 feet by about the end of May, thus completing that section of rubble wall. Concreting the superstructure will not be taken in hand until towards the end of the Monsoon say the 7th September and will be finished about the end of February 1925.

The total length of wall to be executed at Marine Lines in the season *i.e.*, 1,450 feet is about half that contemplated by the Chief Engineer, as given in my report to you dated 10th January 1923 but is in accordance with the programme suggested by my firm in their letter to you dated 3rd November 1923, and I believe with your own views, as there seemed no object in pushing ahead with the wall so far in advance of the filling operations.

At Colaba the work was 795 lin. feet behind the Chief Engineer's programme for 1922-1923 and he did not propose to finish the rubble mound this year, but on my recommendation is doing so.

Cross Bunds

As explained to you in my letter dated 10th January, 1924, eight cross walls had been allowed for by the Chief Engineer in his project estimate, but the nature of the material being dredged and deposited is such that I decided we could dispense with the bunds not yet built and utilize the masonry storm water drains as bunds to divide up the area to be reclaimed into suitable sections. No. 1 Cross Bund at Colaba has been completed and was necessary as a means of communication for the trains of stone to the wall under construction and because the storm water drain in that vicinity had not been built, and it is in order to avoid having to build a similar communication wall which would have been cross bund No. 2 that the whole of the rubble mound at Colaba is being completed this season. No. 7 cross bund (Marine Lines) was put in hand last season, because it was fully expected to begin dredging operations with the " Kalu " in Back Bay before any storm water drain could be built: this expectation has unfortunately not been realized.

Storm Water Drains.

No. 1 Storm Water Drain (Colaba) is in hand and will be finished about the end of May 1924 along with the drain running North to South. No. 8 Storm Water Drain (Marine Lines) is in hand and will be finished in the current season whilst No. 7 will be well under way.

Opinion of work executed.

In my report dated 10th January, 1923, I commented adversely on several matters, notably on the size of the stone being used in the wall. I am glad to say that these defects have been remedied at Colaba, the whole of the work reflects credit on the engineer in charge, the concrete superstructure is an excellent job and the pitching of the outside slope with large stones has been carried on simultaneously with wall construction. At Marine Lines the workmanship is also substantial and well executed,

and although the pitching of the outside slope with large stones had got a little behind-hand, I am assured by the Chief Engineer that it will be completed before the advent of the Monsoon.

Dredging and Reclamation.

It has always been realised that the successful reclamation of the area enclosed by pumping through pipe lines material dredged from the sea bed is the crux of the whole scheme. I commented at length on this phase of the undertaking in my report dated 10th January, 1923, and strongly recommended the appointment of an officer experienced in dredging with the rank of a Deputy Chief Engineer. This appointment was sanctioned and Mr. Brims arrived in Bombay in the month of August 1923. There was an immense amount of work to be done and we hoped to have the dredgers " Sir George Lloyd " and " Kalu " both operating this season, but it was unfortunately impossible to get the " Kalu " ready in time. The " Sir George Lloyd " however began work on the 8th December and had up to the 7th February pumped 212 hours.

I believe I may say that the result up to date has been quite satisfactory, the material in the harbour has proved much harder than we were led to suppose, and actual reclaimed land can be seen and walked upon by any one who chooses to go to Colaba.

To pump 28,000,000 cubic yards of material through pipe lines ranging from 5,000 feet to 12,000 feet in length is however a colossal undertaking and there are bound to be many difficulties to overcome and setbacks in the execution of the work.

The present intention is to take 19 million cubic yards from the harbour side using the " Sir George Lloyd " and " Colaba " dredgers pumping through two pipe lines, and nine million cubic yards from Back Bay using the " Kalu " and possibly for a short time the " Kalu " in conjunction with the " Colaba." The full utilization of Back Bay depends on the removal of the Eastern Telegraph Coy.'s cables and my firm are at present discussing the question with the Managing Director of the Company.

I enclosed with my letter to you dated 10th January a memorandum of a conference I held with the Chief Engineer and the Deputy Chief Engineer, Dredging, and since then I have had the advantage of prolonged conferences with Mr. McMurray the representative of Messrs. Simons and Company the builders of the dredger and the Deputy Chief Engineer, Dredging, when the subject was looked at from all points of view. It may be taken as an axiom that in dredging operations of this magnitude ample skilled supervision is of the first importance and the shore men have to be specially trained on the spot. The best that can be said at present is that a good start has been made and every effort will be strained to work the dredgers both in Back Bay and the Harbour on double shifts at the end of the Monsoon.

Accounts.

I beg to invite a reference to paragraphs 33—36 in my report dated 11th February 1922, and to paragraph 10 in my report dated 10th January 1923.

I understand that accounts officers have been sanctioned and attached to the office of each Deputy Chief Engineer and I have satisfied myself, that cost accounts are being kept, and that the Deputy Chief Engineers know within certain limits what their work is costing. There has not however to my knowledge been any summary of these cost accounts or compilation in detail, against the heads of the project estimate in detail. They are therefore deprived of much of their value. I suggest that the whole work should from time to time be measured up in the way that would be done were it let by contract and the cost placed against each item, whilst in the case of the quarry, it should be considered a separate undertaking selling stone to the works, the total quarry output should correspond with the total sold to the Deputy Chief Engineers and they should be able to check their bills.

I have had very considerable experience in Engineering accounts and with your approval I should like to go into the matter on my return to Bombay after the Monsoon.

My next visit.

As you are aware I visited the works during last Monsoon and satisfied myself that under the most severe monsoon conditions we need have no fear of their stability. I propose therefore to make my next visit about the month of October or early November dependent on the date when dredging operations are renewed.

I am, Dear Sir

Yours faithfully,

(Signed) GEO. C. BUCHANAN.

Bombay, December 15th, 1924.

From

Sir GEORGE BUCHANAN, K.C.I.E.;

To

THE DIRECTOR OF DEVELOPMENT,

Bombay.

Dear Sir,

Since my last report dated 14th February 1924 on the progress made with the Back Bay Reclamation Scheme, work on the construction of the wall and the storm water drains has proceeded according to programme, the work has been well carried out and I have no remarks to make. At the end of the present season 1924-25 the Colaba Section of the wall 11,768 feet in length will be completed except the parapet, and the Marine Lines Section will be completed to 8,000 feet and the gantry to 8,100 feet leaving a gap of 1,771 feet between the Colaba scar end and the end of the gantry.

In 1925-26 it is proposed to build 1,500 feet of wall at the Marine Lines Section leaving a gap of 271 feet which will not be closed for some time as it is intended during the monsoons to house within the harbour created by the walls, the pontoons and pipes in use in Back Bay.

2. I propose in this report to review at some length the position in respect to dredging plant and dredging operations. It has always been realised that the successful reclamation of the area enclosed by the wall, by pumping through pipe lines material dredged from the sea-bed, is the crux of the entire undertaking, and I believe I am correct in saying that dredging operations on this scale have never before been attempted either is India or elsewhere.

Under these circumstances it is not surprising that there have been many difficulties to overcome and that the plan of operation has had to be changed or modified from time to time as new conditions arose.

In the first instance I will describe briefly the various plans discussed since my report dated September 1919 and thereafter I will place before you the programme of operations recommended by the Chief Engineer, the Deputy Chief Engineer, Dredging, and myself in the light of the practical experience obtained to date.

3. The proposal to obtain the material for filling in the area to be reclaimed from the sea, by dredging in the harbour and pumping the material in a fluid state across the Colaba Peninsula to Back Bay, was first considered in 1905 and the detailed survey on which the present scheme is based was prepared by Mr. Kidd in 1911 in connection with what was known as the 1912 project. In this scheme it was intended to have seven pipe lines across the Peninsula between the Harbour and Back Bay, the line farthest North being taken down Church Gate Street.

4. In my report dated September, 1919, I assumed that Mr. Kidd's borings and surveys were correct, and I accepted his conclusions both in regard to quality and quantity of material, but I reduced the number of pipe lines to three that farthest North being designed to be laid along Ormiston Street and thence across the Maidan, entering Back Bay a little to south of the Baths. On this plan the dredger " Sir George Lloyd " and intermediate booster dredger " Colaba " were ordered and designed to pump 2,000 cubic yards of soft clay per hour through 10,000 lineal feet of pipe line.

About the same time the Bombay Government purchased the cutter suction dredger " Kalu "; I believe with special reference to the East Colaba Reclamation Scheme, but the dredger was, on the creation of the Development Directorate, handed over to that Department for general service. The " Sir George Lloyd " arrived in Bombay on the 30th March, 1922, and the " Colaba " on the 20th April, 1922. The delivery of pipes and pontoons began at the end of October, 1921, and by the end of 1922, erection had been completed and the plant was ready to begin operations.

5. In April, 1921, we had sent the Chief Engineer a proposed programme of dredging operations accompanied by a plan No. 3244. We showed on the plan three pipe lines across the Colaba Peninsula, but had shifted the pipe line running along Ormiston Street to a line in the vicinity of Arthur Basin so as to avoid opening up an important public thoroughfare.

We realised that to reach the farthest points of the reclamation the distance of 5,000 feet from the intermediate pumping station " Colaba " would be exceeded, and that it might be necessary to install an additional land booster, but we wished, if possible, to avoid this complication by pumping through the longer line although the output would be diminshed.

6. In May, 1921, the Chief Engineer in letters to us raised the question as to the suitability of the material in the harbour for reclamation purposes, he said it had been very favourably reported on by experts, and he discussed the possibility of obtaining more suitable material in Back Bay. In our letters dated the 22nd June, and the 2nd July, 1921, we quoted the specific statements on the subject made by Mr. Kidd in

his report dated the 3rd August, 1912, and said that we were unable to accept, without much more imformation, the pessimistic reports as to the unsuitability of the material in the harbour, and that it was impossible to come to any conclusion until a dredger had been actually at work for some time on the spot. With reference to dredging in Back Bay we advocated taking borings in the northern section of the Bay, as if there were sufficient soft material to warrant the " Kalu " being put to work, it would be easier and cheaper to reclaim the northern area of the land to be reclaimed by that means than by taking it from the harbour.

7. In September, 1921, we received a letter from the Chief Engineer informing us that the Port Trust and the Director of Indian Marine had raised objections to the dredging of the bed of the harbour in the neighbourhood of the Ballard Pier and Middle ground, and he enclosed a plan showing the revised limits for dredging operations. This reduction in area deprived us of some 15 million cubic yards of material which according to the borings was good clay, and to equalize matters the Chief Engineer had arranged to go farther into the harbour in a South Easterly direction.

8. I visited Bombay in the latter part of 1921 and in my report to you dated 11th February, 1922, I said that although it was impossible to fix definitely a date for starting dredging, I believed it should be practicable to do so towards the end of 1922, and I recommended the early laying of the first pipe line across the Peninsula and the erection of the floating pipe line. In October, 1922, the Chief Engineer submitted his detailed project estimate for the whole scheme and in the covering report he indicated the possibility of obtaining all the material required for the Reclamation from Back Bay itself, and he fixed the date for beginning dredging at one place or the other, for the season 1924-25.

9. In November 1922 I again visited Bombay and was accompanied by Mr. W. T. Halcrow (now a member of my firm). The Chief Engineer had been proceeding with his investigations in Back Bay since my last visit, and on the 8th of December 1922 I convened a conference on the subject of dredging at which were present the Chief Engineer (Mr. Lewis), Mr. Halcrow, Mr. McMurray of Messrs. Simons and Company, and myself. During the conference the Chief Engineer again expressed his fears about the suitability of the material in the harbour for reclamation purposes, and proposed to abandon the harbour and reclaim the whole area from Back Bay; but we pointed out that such a deviation from the original sanctioned project required very grave consideration and that the first thing to do was to ascertain the precise nature of the material in the harbour by a practical test, with a grab or other dredger which was agreed. I also pointed out that the Chief Engineer's programme of work, which did not contemplate beginning dredging until 1924-1925, was not in accordance with our views, which were, that by getting the first pipe line at Colaba laid as soon as possible and completing other preliminary work there should be no difficulty in beginning dredging not later than the end of 1923 monsoon.

10. The result of our deliberations was explained to you in my report dated 10th January 1923, when I said that although I should welcome a supply of good material from Back Bay, I doubted, from the nature of the borings already taken, whether there would be a sufficient depth of dredgable sand and clay in Back Bay to warrant the use of the large dredger, and, whilst agreeing that full investigations should be made in Back Bay area, I was averse to delaying the arrangements already made for dredging from the harbour. I pointed out that dredging in Back Bay involved considerations of navigation, of dredging craft, the effect the deepening of the sea bed might have in increasing wave action, and the best method of dealing with the Eastern Telegraph Company's cables, which traversed the area over which it was proposed to dredge, and I further observed that in our programme we had fixed the date for beginning dredging and filling at Colaba for December 1922, and I still consider it should have been possible to commence dredging that season, if however, no action was taken in laying the first pipe line until all the borings in Back Bay had been made, I was afraid that another season might pass without getting the large dredger to work. I recommended that very early action be taken in putting the dredger " Kalu " into working order and arranging for any additional pipe line required, and lastly I recommended the early appointment of a Deputy Chief Engineer, Dredging, to take entire charge of dredging operations, if an officer with the necessary experience could be obtained.

The laying of the first pipe line at Colaba was put in hand in September 1923 and completed in November 1923. The repairs to the " Kalu " were begun in May 1923 and completed September 1924, and the Deputy Chief Engineer, Dredging, was appointed and arrived in Bombay in August 1923.

11. On the 23rd March 1923 the Chief Engineer sent us a statement showing the results of the borings taken in Back Bay during the year, which showed an average depth of 14·18 feet of dredgable material over the area tested, and on the 3rd May 1923 we addressed the Chief Engineer on the subject, and said that with regard to the general

dredging programme we had prepared a scheme on the assumption that an effort would be made to put both dredgers into commission after the monsoon. Our letter was accompanied by plan No. 3411, and we showed the " Kalu " working in Back Bay in conjunction with the " Colaba," and the " Sir George Lloyd " working in the harbour alone on her own pipe line. We hoped that the " Kalu " and " Colaba " would during the season remove a great deal of the material in Back Bay farthest away from the wall, and that the following season the " Kalu " would operate with her own pipe line only, leaving the " Colaba " free to work in the harbour with the " Sir George Lloyd."

Our letter crossed a letter dated 7th May 1923 from the Chief Engineer in which he gave us the final result of the borings in Back Bay showing that in area A, a volume of 25,333,000 cubic yards of material were available or more than the total required for the whole reclamation.

Mr. Lewis remarked that the material was decidedly good and much more suitable for filling than the material in harbour. He thought the use of this material was clearly indicated, and asked for the opinion on the matter so that arrangements could be made as soon as possible for the next year's work. In acknowledging receipt of this letter on the 21st June 1923, we said that as I was leaving Bombay the following week the matter could be discussed with me on the spot.

12. I arrived in Bombay during the second week in July 1923. By that time the experimental dredging in the harbour had been carried out, and, so far as one could judge, the silt and clay was perfectly suitable for reclamation purposes, so much so that after consideration and several conferences, I wrote to the Chief Engineer on the 26th July and said it was understood that the scheme put forward in our letter dated 3rd July 1923, and shown on drawing No. 3411, would be adopted, and we hoped both dredgers would do good work in the coming season. I wrote to you on the 9th August confirming this arrangement, and said that the most important matter now was to get the dredgers started, and that the alteration I had made in the position of the Colaba cross bund should enable the " Sir George Lloyd " to begin operations some time in November.

13. I left Bombay on the 11th August 1923 and on the 3rd November we sent you a programme of operations on the assumption that the " Sir George Lloyd " would work in the harbour and the " Kalu " in Back Bay, and the " Colaba " partly with the " Sir George Lloyd " and partly with " Kalu," and we remarked that work in Back Bay would be subject to satisfactory arrangements being made with the Eastern Telegraph Company for the removal of their cables, that negotiations were in progress, but that it was matter for regret this matter had not been taken up many months ago.

14. I returned to Bombay in December 1923 and the dredger " Sir George Lloyd " had begun to work in the harbour on the 8th December 1923, but unfortunately the repairs to the " Kalu " were still incomplete, also the pipe line had not arrived from England, so that it was impossible to do any work in Back Bay.

At a conference on dredging operations held in the Chief Engineer's office on the 9th January, the following conclusions were arrived at.

(1) It will not be practicable, so far as one can see to work the " Sir George Lloyd " on double shift this season, or do any work with the " Kalu," but every effort must be made to work both dredgers on continual double shift next season.

(2) The proposed pipe line through the B. B. and C. I. Railway yard near Woodhouse bridge, or alternatively down Ormiston Street involves such an immense amount of costly and difficult work that all idea of a pipe line in that vicinity should be abandoned. Ample material for the reclamation can be obtained from the harbour and Back Bay combined, without dredging from the Northern side of the harbour area. It is proposed to fill areas 1 and 2, *i.e.*, to near storm water drain No. 4 from the harbour pumping through pipe lines, Nos. 1 and 3, and the remaining area from Back Bay in which connection it will be advisable to remove the Telegraph Company's cables.

In forwarding the findings of the conference to you I observed in a covering letter dated 10th January 1924, that after the grave doubts which had been expressed at various times as to the suitability of the material in the bed of the harbour for reclamation purposes, it was an agreeable surprise to see that what was being pumped consisted largely of a hard compact clay with which we had reason to be quite satisfied. I also stated that in view of the nature of the material, I felt justified in dispensing with the stone cross bunds, which would effect a considerable saving.

15. On the 31st January, 1924, my partner Mr. Halcrow, interviewed Admiral Grant the Managing Director of the Eastern Telegraph Company in London, with respect to the moving of the cables in Back Bay, and after considerable negotiations and correspondence, it was agreed that the dredger " Kalu " should begin operations in Back Bay on the area North of the existing cables, and when dredging was completed in that area, the Company would lay new twin core shore cables across that area. The existing cables would then have to be removed and the dredger work over that area.

16. On the 2nd May 1924, the Chief Engineer addressed us at some length on the subject of dredging plant and dredging operations. He sent us a plan of operations showing the proposed locality in the harbour for the " Sir George Lloyd " and " Colaba " in 1924-25, and proposed that the " Kalu " should also work in the harbour pumping through pipe line No. 3 instead of in Back Bay, his reason being that the negotiations with the Eastern Telegraph Company on the subject of shifting the cable would not be finished in time to allow of the " Kalu " proceeding to Back Bay until the season was well advanced, and that she would not do much more than dig the approach channel and the Bell mouth by the end of the season. He also recommended the purchase of additional floating and short pipes and the installation of an intermediate pumping station to work with the " Kalu " in Back Bay. For this purpose he suggested that it might be possible to purchase the " Jinga " and plant the engines, boilers and pump on a barge or pontoon. In our reply dated 5th June 1924, we accepted the position of the " Sir George Lloyd " and " Colaba " for 1924-25, but adhered to our opinion that whatever the future decision respecting the cables in Back Bay, the " Kalu " should begin work in Back Bay operating in the area North of the cables and in order that the work might be begun without an Intermediate Station, we recommended that the " Kalu " should be taken in at high water to the nearest point to the new wall, where she would either dredge a hole for her own flotation or float in a hole already prepared by another dredger. This scheme had the advantage over the previous one that as soon as the hole was dredged the " Kalu " could begin actual reclamation, whereas in the former proposal she would have been occupied the greater part of the season in digging the approach channel and Bell mouth.

In the matter of the pipes we recommended the purchase of an additional 1,000 feet of 42 inches floating pipe line and 5,500 feet of shore pipe line which was less than the Chief Engineer had asked for and we suggested the whole subject might be discussed with me on my next visit to Bombay.

With reference to the Intermediate Booster Station for the " Kalu " we suggested that before taking any action the possibility of using an electrically worked pump should be investigated, as being probably cheaper both as regards capital cost and the working expenses.

17. In order that there might be no misunderstanding on the subject we wrote to the Chief Engineer on the 11th September, 1924, saying that as dredging and reclamation operations were shortly to be resumed we understood that the programme of work arranged for the next working season was as follows :—

(1) The " Sir George Lloyd " to commence dredging at the south-eastern extremity of the Harbour area limits in conjunction with the " Colaba " and discharging through pipe line No. 1 to reclaim the area south of storm water drain No. 1.

(2) The " Kalu " to commence dredging within the dredging area limits north of the Eastern Telegraph Company's cables in Back Bay and reclaim the northern corner of the Back Bay Reclamation.

18. Every preparation was made to begin dredging operations at the earliest possible date for this season's work. It was impossible to dredge the basin for the " Colaba " last season as the floatng pipe line in operation with the " Sir George Lloyd " crossed the site, but negotiations with the Royal Indian Marine for the hire of the bucket dredger " Cachalot " to dredge the basin were begun in May 1924, and it was arranged to commence operations about the middle of September 1924. Dredging was actually begun on the 20th September, which was the first day the weather was sufficiently calm, but on the 27th September the vessel sprang a leak on the port side of the ladder well, and had to dry dock for examination and repair. The " Cachalot " resumed work on Friday the 3rd October, after a delay of a week and on the 9th October, the officials of the R.I.M. decided the material was too hard to be dredged by their vessel and withdrew the " Cachalot " from the work.

The whole time Priestman Grab was then put on, but without satisfactory result and finally arrangements were made with the Port Trust for the use of their Dipper dredger and she commenced work on the 31st October and finished on the 17th November, but on the same evening broke her after spud and did not get clear of the berth until the 19th November. These delays in getting the basin dredged for the " Colaba " amounted in all to 27 days. The " Colaba " which has been lying at anchor in deep water in the vicinity of the new basin, was brought in and moored in position on Thursday the 20th November, and a start made the same day connecting up the pontoons to the shore and on the 21st November work was put in hand connecting the pontoons between the " Colaba " and the " Sir George Lloyd ", which had been moored in position ready to commence work since the 13th October.

Ordinarily the connecting of the pontoons would have been completed in the course of about two weeks, but in spite of the fact that owing to the experience of strong ebb tides last season a number of additional moorings had been provided on the pontoons, they were not sufficient, the anchors dragged and the whole line had to be replaced, a slow and tedious operation. Additional 30 cwt. anchors were obtained as soon as possible and dredging proper was begun on the morning of the 6th December.

19. The delay in beginning actual operations amounts to four weeks which is a serious matter, but speaking with full knowledge, as I have been here all the time, I can say that I am satisfied that the dredging department personnel have done all that is humanly possible to get on with the work. As I have already pointed out, dredging operations on this scale have never before been attempted and difficulties occur which it is impossible to foresee. It is of the very first importance to take every precaution to avoid any breaking of the pipe line during pumping as if such occurred close to the bow of the " Colaba " when she was pumping full pressure, the consequences might be most serious.

It is also of paramount importance to maintain instantaneous communication between the " Sir George Lloyd " and the " Colaba " which are separated one mile from each other and to that end not only is there a telephone which must be maintained in perfect order, but alternative signalling arrangements have been arranged in case the telephone breaks down.

20. As already explained the arrangement for the " Kalu " was, to go into Back Bay and, after digging a hole for her own flotation, proceed with her own pipe line to dredge the area north of the cables. We had hoped that she would be able to rest on the sea bed during the period of Low Water, as she had done when employed upon the Sewree Reclamation, but the Deputy Chief Engineer, Dredging, considered the bottom too hard, and that there was some risk to the vessel involved, so that she had to be moored in deep water, go in at High Water and retire in time to get back to her base before grounding. Once the hole is completed she will dredge continuously. Operations were commenced by the dredger " Kalu " working tide work on the 28th November, and the reason she could not begin sooner was that the men were not yet trained and it was impossible to spare earlier the Senior Dredging Master, who was fully occupied in the harbour. The " Kalu " worked until the afternoon of the 1st December when operations had to cease owing to neap tides, and she resumed again on the 10th December, and had again to suspend on the 14th December. The material met with has proved to be very stiff, and in addition heavy swells have been experienced, making it extremely difficult to connect the stern pipe of the dredger to the first pontoon, this operation alone on several days taking as long as one hour over and above the time required for getting into position and picking up moorings.

21. The foregoing brings the history of the discussions and negotiations in respect to dredging plant and dredging operations up to date, and I have thought it desirable to describe them at some length so that this report may contain a complete record of what has occurred. I arrived in Bombay on the 24th October, 1924, and have spent most of my time working out, in consultation with the Chief Engineer and Deputy Chief Engineer, Dredging, what we hope may prove a final and complete programme which I will now describe.

22. *Quantity of material required and locality from which it is to be dredged.*— Twenty-eight million cubic yards of material is the total amount required for filling the area to be reclaimed, and it was originally intended to obtain the whole of the amount from the harbour.

This has now been found to be impracticable, partly on account of the curtailment of the original area by the Port Trust, and partly the unforseen great difficulties and expense in laying the pipe lines across the Peninsula. The accompanying plan shows the area from which it is now proposed to dredge the material, and the following statement gives the figures in detail.

Available in Harbour.

	Cubic Yards.
Material available in area hatched red on plan	14,364,000
On the assumption that 75 per cent. of the material available is pumped ashore and remains in the reclamation. 75 per cent. of 14,364,000 ...	10,773,000
It is proposed to fill from the Harbour the area in Back Bay from Colaba point up to storm water drain No. 4	14,145,000
Amount available in area hatched red	10,773,000
Balance	3,372,000

This balance will be obtained by either dredging further out into the Harbour or in the enclosed but uncoloured area.

Available in Back Bay.

	Cubic Yards.
Material available North of cables on area hatched red	7,345,000
Material available South of cables and area occupied by cables on area hatched blue	7,750,000
Total	15,095,000
Take 75 per cent. as being the probable amount pumped and remaining in the reclamation	11,321,250
It is proposed to fill from Back Bay the whole of the area from Storm Water Drain No. 4 Northwards	12,733,000
Amount available	11,321,250
Balance	1,411,750

This balance will be obtained by dredging South of the coloured area.

Output of Dredgers.

23. The " Sir George Lloyd " and " Colaba " were designed to discharge 2,000 cubic yards of soft clay per hour through 10,000 feet of 42 inch pipes. Last season the material actually dealt with was not soft clay but silt and stiff clay with some sand and stones which although much better than soft clay from the point of view of suitable material for reclamation is heavier and more difficult to pass through the pipe line.

Until considerably more work has been done it is impossible to say of what the bulk of the material to be dredged will consist, but I think it is safe to assume that we shall not get to the full output of 2,000 cubic yards per hour, and that fact must be faced. If we get two-thirds of the estimated total output we shall be doing well, but naturally the time required to complete the work, and the cost of pumping, will be increased.

Dredging Plant.

24. The sanctioned project estimate was on the assumption that there would be three pipe lines across the Colaba Peninsula and that the whole of the material would be obtained from the harbour, the use of Back Bay as a source of supply being noted in the Chief Engineer's report as a possibility. The dredger " Kalu " was added to the plant specially purchased for the work, and it was stated she would be used either in connection with the " Sir George Lloyd " or independently, as might be found desirable, and 2,500 feet of floating pipe line was provided.

On the programme outlined in this report it is obvious that more floating pipe line is required to enable the " Sir George Lloyd " to reach the farthest points of the dredging area, and in actual practice it was found that insufficient shore pipe line had been provided to enable the material to be promptly distributed through various branches without causing delays to the dredger. The combined length of floating pipe line and the shore pipe line will at the greatest aggregate 12,000 feet, or even more, and as, theoretically, the plant is only calculated to pump 10,000 feet it has been a subject of consideration whether an additional booster on shore would be necessary. On the one hand there is the additional capital cost of the shore booster combined with the difficulty of working a line with three independent pumps on one pipe line, and on the other the disadvantage that with a pipe line much exceeding 10,000 feet in length the output per hour will be correspondingly reduced. Taking everything into consideration we are all agreed that the latter alternative is the most suitable, especially as the very long pipe line does not apply to the whole of the work.

25. In Back Bay for work in conjunction with the " Kalu " an Intermediate Boosting station is an absolute necessity, and we obtained a quotation from Messrs. Simons & Co. for a complete plant the cost of which delivered in Bombay amounts to Rs. 25,00,000, but we think a plant can be contrived at a much cheaper rate, and we recommend that negotiations be opened for purchase of the " Jinga " subject to inspection of the machinery by a competent Marine Engineer. Assuming that the inspection is satisfactory, and that the " Jinga " can be purchased for not exceeding £12,000, we estimate the complete booster plant should be installed for not exceeding Rs. 10,00,000.

Staff.

26. The vital importance on a work of such magnitude of an adequate and competent staff is not generally realised. When I arrived in Bombay last year I found the working of the dredger " Sir George Lloyd " dependent on the health and energy of one man, and if he had fallen sick the dredger would have had to suspend operations. I represented the matter to you and immediate measures were taken to obtain from

home an Assistant Dredging Master. I am disposed to think we still have, to use a homely simile, " Too many eggs in one basket." Last September Mr. Speirs, the Dredging Superintendent, was home on leave, and was ordered to pass a medical examination before he returned to Bombay. He was definitely rejected by the Medical Board, and had it not been for our urgent representations to the High Commissioner, who passed the case on to you, he would not have been allowed to come out, in which case dredging operations would have been very gravely delayed, because we have no other man with such practical knowledge of suction cutter dredgers. The new men are all inexperienced in this class of work, and are being trained by the Deputy Chief Engineer, Dredging, and the Dredging Superintendent, but we have no understudy to the Dredging Superintendent, and I think the necessity for such should be considered.

Summary.

27. It will be convenient now to summarize the position.

(1) It was originally proposed to obtain the whole of the material for the reclamation from the harbour, and for that purpose the " Sir George Lloyd " dredger and the " Colaba " Intermediate pumping station were purchased. It was estimated that this plant, operating for 170 days per annum and working 15 hours a day, would deal with 5 million cubic yards per annum, and that the work of the dredgers would be completed in six years from beginning of dredging operations.

(2) Owing to the curtailment of the area in the harbour plus the difficulties of laying pipe lines across the Peninsula it is necessary to go to Back Bay for a portion of the material, and the proposal now is to take 14½ million cubic yards from the harbour and 13 million cubic yards from Back Bay.

(3) The dredger " Kalu " has been purchased and placed into thorough repair and has cost along with her pipe line Rs. 23,63,367. It is proposed to utilize her for the work in Back Bay, but, without an intermediate boosting station, the " Kalu " can do but little; she could dredge up to near the 4,000 feet line in the area hatched red on the plan but could do nothing in the blue area until the Eastern Telegraph Company's cables have been removed, and they cannot be touched until the whole of the red area has been dredged.

(4) The " Sir George Lloyd " cannot herself work to advantage in Back Bay as she is not built for shallow dredging, but the " Colaba " could work in conjunction with the " Kalu " were she not required to work in the harbour with the " Sir George Lloyd ".

(5) It is improbable, with the class of material now being taken from the harbour, that the " Sir George Lloyd " will do her estimated output of 5 million cubic yards per annum. The total quantity to be dredged is 14,145,000 cubic yards and the time required may be put at, say, 6 years.

(6) If the " Kalu " and a new booster worked simultaneously with the " Sir George Lloyd " and the " Colaba " the whole of the reclamation should be completed in 6 years from the present time.

(7) The alternative procedure, on the assumption that it is decided to use the " Colaba " in Back Bay thus saving the capital cost of the new booster, will be to let the " Kalu " work on her own pipe line for the remainder of this season, and possibly the greater part of next season, and then lay her up until the " Colaba " is available, but this would probably prolong the completion of the work by about 5 years.

(8) On full consideration of all the circumstances I strongly recommend that the programme now submitted be approved, and that sanction be accorded to the purchase of the " Jinga " for conversion into an intermediate pumping station for use with the " Kalu " if after inspection she is proved to be fit for the work and can be obtained at a moderate price, as from all points of view this seems to be the most economic procedure.

Revised Project Estimate.

28. A revised project estimate for the whole work was submitted by Mr. Lewis, the then Chief Engineer, in July last, and was sent to us for our remarks, when we replied that the matter would be taken up by me on my return to Bombay.

The sanctioned project estimate amounted to Rs. 7,02,43,321, and the revised estimate Rs. 7,26,54,401, an excess of Rs. 24,11,080.

There have been material savings in several directions notably in the sea walls and cross walls, and the principal excesses are on dredging plant, dredging and filling, works maintenance, medical and sanitary work and unforeseen charges.

I have gone into the matter very carefully with the Chief Engineer and understand he wishes to submit his revised estimate after the receipt of actuals at the end of the financial year.

So far as I can see Mr. Lewis's figures are generally acceptable, except that the cost of dredging and filling must be an uncertain quantity until we have had experience of this season's work, and that in any case there must be added the sum of 3½ lakhs for removal of cables in Back Bay, and to dredging plant 5 lakhs for the intermediate pumping station to work the " Kalu " if that is approved, Mr. Lewis having already allowed 5 lakhs.

I have asked the Chief Engineer kindly to prepare at once a revised estimate for dredging plant, with an explanatory note of the excesses and final proposals.

I am, Dear Sir,
Yours faithfully,
(Signed) GEO. C. BUCHANAN.

V.—STATEMENT SHOWING THE TOTAL EXPENDITURE ON THE RECLAMATION UP TO JUNE 30TH, 1926.*

Project Item No.	Project heads.	Estimated Provision.	Actual Expenditure. To end of 1924-25.	Actual Expenditure. During 1925-26.	Actual Expenditure. During 1926-27.	Total.
I	Gantry	13.68.481	10.84.307	5.469	2.619	10.81.457
II	Sea wall on rubble mound—					
	Marine lines section—					
	(1) Tipped rubble...		7.15.685	1.50.561	7.991	8.74.237
	(2) Protection stones		46.773	926	—	47.699
	(3) Mass concrete wall.	78.14.526	12.52.311	1 65.425	1.017	14.18.753
	Colaba section—					
	(1) Tipped rubble...		7.02.972	3.06.673	—	10.09.645
	(2) Protection stones		88.517	51.580	—	1.40.097
	(3) Mass concrete wall.		8.21.658	1.20.339	—	9.41.997
	(4) Cement C.P.wall		—	12.890	—	12.890
III	Mass concrete wall, Colaba.	10.02.432	7 52.949	—	—	7 52.949
IV	Cross wall—					
	(1) Colaba section...	19.40.400	2,13.468	2.689	—	2.16.157
	(2) Marine lines section.		48.887	1.151	50	50.088
VA	Kandivlee Quarry acquisition.	1.50.000	4.69.884	98.521	1.834	5.70.239
VB	Kandivlee Quarry opening.	18.26.300	17.79.328	40.812	—	18.20.140
VC	Machinery and building, Kandivlee.	27.59.498	27.38.644	17.885	—	27.20.759
VIA	Capital cost, Marine lines	9.04.290	8.74.490	7.605	232	8.82.327
VIB	Marine lines machinery and buildings.	14.98.879	14.72.402	108	—	14.72.510
VIIA	Colaba, preparation of site.	1.75.174	3.19.118	930	—	3.20.048
VIIB	Colaba, machinery and buildings.	9.03.313	9.80.106	—	—	9.80.106
VIII	Marine lines, Colaba Rail.	7.72.534	8.46.366	8.010	—	8.38.356
IX	Transportion and reserve stock.	24.05.448	21.48.964	—	—	21.48.964
X	Dredging plant	1.34.04.860	1 44.23.799	8.07.356	10.769	1.52.41.924
XI	Shore pipe trenching ...	3.89.249	1.62.911	10.828	—	1.73.739
XII	Dredging and filling ...	82.03.125	16.41.097	18.94.268	4.64.401	39.99.766
XIII	Murum filling	31.36.712	—	17.018	—	17.018
XIV	Equipment of area with drains and lights.	1.19.95.762	—	—	—	—
XV	Equipment of area with drains.	27.66,750	—	—	—	—
XVI	Storm water drains—					
	(1) Marine lines section	64.28.100	4.37.193	2.55.548	40.552	7.33.293
	(2) Colaba section ...		12.12.170	4.14.089	—	16.26.259
	(3) Kandivlee ...		1.63.087	6.309	—	1.69.396
	Carried forward ...	6.98.45.833	3.53.97.086	43.96.990	5.29.465	4.02.60.813

* NOTE.—These figures are published as received by the Committee. They are not, however, arithmetically correct. For instance : the total given for machinery and buildings, Kandivlee (item VC) is arrived at by subtracting Rs. 17.885 from Rs. 27.38.644, whereas these two sums should have been added together. Further, the total expenditure to the end of June, 1926, excluding interest, is given as Rs. 4.72.06.841, whereas Statement VI states the expenditure over the same period to be Rs. 4.68.05.764. The latter sum appears to be the correct one.

Project Item No.	Project heads.	Estimated Provision.	Actual Expenditure. To end of 1924-25.	Actual Expenditure. During 1925-26.	Actual Expenditure. During 1926-27.	Total.
	Brought forward ...	6.98.45.833	3.53.97.086	43.96.990	5.29.465	4.02.60.813
XVIII	Consultant's fees ...	13,68.888	4 20.942	75.737	—	4.96.679
XIX	Unforeseen	10.00.000	97.345	14.024	3.928	1.15.297
XX	Maintenance of work ...	—	3.25.495	1.06.076	11.198	4.42.769
XXI	Survey of mathemetical instruments.	—	15.995	263	—	16.258
XXII	Medical and sanitary works.	—	1.70.302	73.881	5.234	2.49.417
XXIII	Miscellaneous works for the convenience of the public.	—	433	—	—	433
—	Suspense working quarry	—	8.68.824	7.36.365	2.018	1.34.477
—	Expenditure incurred on account of land at Colaba.	—	3.81.790	—	—	3.81.790
—	Unallocated	—	—	—	7.145	7.145
	Total, I works ...	7.22.14.721	3.76.78.212	38.67.878	5.58.988	4.21.05.078
XVII	Establishment	52.98.600	26.84.188	8.03.347	1.82.734	36.70.279
	Interest and General charges.	—	82.65.048	32.49.587	8.88.420	1.24 03.055
	E. Suspense	—	10.58.503	1.07.006	20.304	11.45.205
	Share of tools and plant of S.E. IV.	—	2.579	—	—	2.579
	Deduct (1) Value of plant and dredger at the end of work.	67.00.000	—	—	—	—
	(2) Credit for plant (3) Receipts on capital account.	5.70.000	— 79.177	— 22.411	— 5.760	— 1.07.348
	Total	7.02.43.321	4.96.09.363	80.05.407	16.04.078	5.92.18.848

	Rs.
Total to end of June, 1926, including interest	5.92.18.848
Approximate for July 26, including interest	5.48.292
	Rs. 5.97.67.140
To end of June, 1926, excluding interest	4.72.06.841
Approximate for July, 1926, excluding interest	2.44.531
	Rs. 4.74.51.372

VI.—ESTIMATE FOR THE COMPLETION OF THE BACK BAY RECLAMATION SCHEME.

Block No. 8	21,99,269
Block No. 7	48,22,895
Block No. 6	59,76,473
Block No. 5	71,10,698
Block No. 4	75,88,873
Block No. 3	1,12,49,499
Block No. 2	33,80,768
Block No. 1	29,88,480
Total amount to complete	4,53,16,955
Add Establishment charges at 12 per cent.	54,38,035
	5,07,54,990
Add 5 per cent. for contingences	25,37,750
	5,32,92,740
Add total expenditure to 30th June, 1926	4,68,05,764*
	10,00,98,504
Or say Rs.	10,00,98,500

(Signed) H. A. ELGEE,
Chief Engineer,
Back Bay Reclamation Scheme.

* See footnote to Statement V, page 37.

Notes on estimate for the completion of the Back Bay Reclamation Scheme.

Block No. 8.—It is proposed to complete the filling with moorum dry filling.

Block No. 7.—To be completed by dredged filling from the Harbour and moorum dry fillling.

Block No. 6.—As above.

Block No. 5.—As above.

Block No. 4.—To be completed by dredged filling from the Harbour and moorum dry filling. As the area cannot be entirely filled by dredging, one quarter of the filling required, after the sealing of the wall and moorum topping are deducted, is taken as moorum dry filling.

Block No. 3.—To be completed by moorum dry filling only.

Block No. 2.—To be completed by dredged filling from Back Bay and moorum dry filling.

Block No. 1.—To be completed by dredged filling from Back Bay and filling by motor lorries.

Bunds.—Where dredgings are to be deposited the rubble mound will be sealed with moorum dry filling. The Cross Bunds, in the first instance, will be tipped to a top width of 30 feet and after dredging has been stopped will be widened out to a top width of 120 feet.

Item.	Quantity.	Unit.	Rate.	Amount.
Block No. 1.				
			Rs.	Rs.
Filling by lorries	226,700	C. Yd.	2·70	6,12,090
Dredged filling from Back Bay	1,033,400	,,	0·88	9,09,392
Concrete in parapet	2,073	,,	48·60	1,00,746
S.W.D. No. 7.				
Excavation in rock and boulders	388	,,	9·50	3,686
Excavation in sand and earth	388	,,	2·70	1,048
Concrete 1 : 2 : 4 in founds	266	,,	43·20	11,491
Do. in situ	604	,,	43·20	26,093
Do. in precast blocks	957	,,	43·20	41,342
Footpaths	28,026	Super yd.	4·50	1,26,117
Carriage way	31,013	,,	12·00	3,72,156
Grass	7,214	,,	2·50	18,035
Ride	9,025	,,	2·50	22,563
Roads	28,061	,,	12·00	3,36,732
Lighting	9,509	ft. run	1·00	9,509
Sewers	9,509	,,	22·00	2,09,198
Minor S.W. Drains	6,099	,,	25·00	1,52,475
Do.	3,410	,,	10·50	35,805
		Total for Block No. 1 ...		29,88,480
Block No. 2.				
Murum filling	372,000	C. yd.	1·57	5,84,040
Dredged filling from Back Bay	1,678,050	,,	0·88	14,76,684
Reinforced concrete in parapet	722	,,	48·00	35,089
S.W.D No. 6.				
Excavation in rock and boulders	2,095	,,	9·50	19,903
Excavation in sand or earth	1,395	,,	2·70	3,767
Concrete 1 : 2 : 4 in situ	4,902	,,	43·20	2,11,766
Footpaths	23,861	Super yd.	4·50	1,07,375
Carriage way	13,920	,,	12·00	1,67,040
Grass	14,622	,,	2·50	36,555
Roads	37,478	,,	12·00	4,49,736
Lighting	6,751	Ft. run	1·00	6,751
Sewers	6,751	,,	22·00	1,48,522
Minor S.W. drains	4,321	,,	25·00	1,08,025
Do.	2,430	,,	10·50	25,515
		Total for Block No. 2 ...		33,80,768
Block No. 3.				
Murum filling	4,399,078	C. yd.	1·57	69,06,552
Parapet reinforced concrete	983	,,	48·60	47,774
Wall.				
Gantry	20	Bays	1,682	33,640
Rubble mound	5,875	Tons	3·80	22,325
Protection stone	1,665	,,	5·40	8,991
Mass concrete, 1 : 2½ : 5	746	C. yd.	40·50	30,213
Storm Water Drain No. 5.				
Excavation in sand and earth	1,381	,,	2·70	3,729
Rubble in founds	5,708	,,	3·78	21,576
Concrete in founds	1,490	,,	43·20	64,368
Concrete in situ	1,583	,,	43·20	68.386
Do. precast blocks	5,839	,,	43·20	2,52,245
		Carried forward		74,59,799

Item.	Quantity.	Unit.	Rate.	Amount.
Block No. 3—continued.				
Brought forward				74,59,799
Footpaths	5,460	Super yd.	4·50	2,04,570
Carriage way...	19,058	„	12·00	2,28,696
Grass	24,110	„	2·50	60,275
Ride	6,950	„	2·50	17,375
Roads	170,312	„	12·00	20,43,744
Lighting	29,152	Ft. run	1·00	29,152
Sewers ... ... —	29,152	„	22·00	6,41,344
Minor S.W. drains	17,824	„	25·00	4,45,600
Do.	11,328	„	10·50	1,18,944
Total for Block No. 3 ...				1,12,49,499
Block No. 4.				
Wall.				
Gantry	165	Bays.	1,682	2,77,530
Rubble Mound	34,622	Ton.	3·80	1,31,564
Protection stone	12,355	„	5·40	66,609
Mass concrete 1: 2½: 5	5,645	C. yd.	40·50	2,28,623
Reinforced concrete in Parapet	766	„	48·60	37,228
Murum filling	1,421,000	„	1·57	22,30,970
Dredged filllng from the Harbour	2,857,000	„	0·64	18,28,480
Footpaths	43,625	Super yd.	4·50	1,96,313
Carriage way	14,773	„	12·00	1,77,276
Grass	27,448	„	2·50	68,620
Ride	10,692	„	2·50	26,730
Roads	124,469	„	12·00	14,93,628
Lighting	18.980	Ft. run.	1·00	18,980
Sewers	13,980	„	22·00	4,17,560
Minor S.W. Drains	13,067	„	25·00	3,26,675
Do.	5,913	„	10·50	62,087
Total for Block No. 4				75,88,873
Block No. 5.				
Murum filling	856,100	C. yd.	1·57	13,44,077
Dredged filling from harbour	3,404,600	„	0·64	21,78,944
Reinforced concrete parapet 1:2:4	822	„	48·60	39,949
S.W.D. No. 4.				
Excavation in rock and boulders	3,455	„	9·50	32,823
Excavation in sand or earth	2,365	„	2·70	6,386
Rubble in founds...	1,963	„	3·78	7,420
Concrete in founds 1:2:4	1,462	„	43 20	63.158
Do. 2:2:4 in situ	2,983	„	43·20	1,28,866
Do. do. in precast blocks	5,169	„	43·20	2,23,304
Footpaths	45,122	Super yd.	4·50	2,03,049
Carriage way...	15,858	„	12·00	1,90,296
Grass	30,816	„	2·50	77,040
Ride	10,866	„	2·50	27,215
Roads...	133,563	„	12·00	16,02,756
Lighting	23,438	Ft. run	1·00	23,438
Sewers	23,438	„	22·00	5,15,636
Minor drains...	13,810	„	25·00	3,45,250
Do.	9,628	„	10·50	1,01,094
Total for Block No. 5 ...				71,10,698
Block No. 6.				
Murum filling	812,100	C. Yd.	1·57	12,74,997
Dredged filling from Harbour	2,727,750	„	0·64	17,45,760
Reinforced concrete (Parapet) 1 : 2 : 4	730	„	48·60	35,478
S.W.D. No. 3.				
Excavation in rock and boulders	1,440	„	9·50	13,680
Rubble in founds	2,256	„	3·78	8,528
Concrete 1 : 2 : 4 in situ	2,055	„	45·20	88,776
Footpaths	39,588	Super yd.	4·50	1,78,146
Carriage way...	14,080	„	12·00	1,68,960
Grass	27,290	„	2·50	68,225
Ride	4,028	„	2·50	10,070
Roads...	121,378	„	12·00	14,56,536
Lighting	22,481	Ft. run.	1·00	22,481
Sewers	22,481	„	22·00	4,94,582
Minor S.W. Drains	12,014	„	25·00	3,00,350
Do.	10,467	„	10·50	1,09,904
Total for Block No. 6 ...				59,76,473

Item.	Quantity.	Unit.	Rate.	Amount.
Block No. 7.				
Murum filling	728,700	C. yd.	1·57	11,44,059
Dredged filling from Harbour	2,050,000	,,	0·64	13,12,000
Reinforced concrete Parapet 1:2:4	1,244	,,	48·60	60,458
Footpaths	49,246	Super yd.	4·50	2,21,607
Carriage way	23,831	,,	12·00	2,85,972
Grass	33,870	,,	2·50	84,675
Ride	5,402	,,	2·50	13,505
Roads	83,030	,,	12·00	9,96,360
Lighting	18,462	Ft. run.	1·00	18,462
Sewerage	18,462	,,	22·00	4,06,164
Minor S.W. Drains	5,916	,,	25·00	1,47,900
Do.	12,546	,,	10·50	1,31,733
		Total Block No. 7 ...		48,22,895
Block No. 8.				
Murum filling	753,332	C. yd.	1·57	11,82,731
Dredged filling		Complete		
Parapet, Concrete 1:2:4 reinforced	2,635	C. yd.	48·60	1,28,061
Footpaths	30,690	Super yd.	4·50	1,38,105
Carriageway	50,542	,,	12·00	6,06,504
Grass	5,300	,,	2·50	13,250
Roads	10,155	,,	12·00	1,21,860
Lighting	8,758	Ft. run	1·00	8,758
		Total for Block 8 ...		21,99,269

VII.—SIR GEORGE CURTIS' REPLIES TO THE QUESTIONS ADDRESSED TO HIM BY THE COMMITTEE.

Q. 1.—On 3rd August, 1920 (the date of the announcement of the creation of the Development Directorate), what position did you hold in the Government of Bombay?

Q. 2.—For how long had you held this position?

Q. 3.—When did you leave India?

Q. 4.—Were you the Member in Charge of the Development Directorate, and if so, over what period?

A. 1, 2, 3 and 4.—I was Member of the Bombay Executive Council from 16th April, 1916, to 16th April, 1921. I had charge throughout that period of what was known as the Development Department, which was concerned with questions affecting the Development of Bombay, which did not include the Back Bay Reclamation Scheme. This was dealt with in the Public Works Department, of which His Excellency the Governor had charge. The Development Directorate was constituted on 2nd November, 1920, as far as I can remember. I was in charge of it until the end of December, 1920. I doubt, however, whether during these two months papers relating to the reclamation were dealt with by the Development Directorate; at any rate, no decision of any importance was arrived at.

I left India on 21st April, 1921.

Q. 5.—Give as nearly as possible the date on which you first learnt that the Government of Bombay proposed to re-examine the question of the reclamation of Back Bay?

Q. 6.—How and from whom did you so learn it?

A. 5 and 6.—I first heard of the proposal to re-examine the Reclamation scheme in 1909. I was then Survey Commissioner engaged on a scheme to re-map Bombay Island, and I remember Mr. W. L. Cameron, then chief engineer, mentioning the project to reclaim and emphasising the importance to the engineers of an up-to-date map which would show accurately the littoral and other important areas. In spite of opposition the survey scheme went through, and the result has been the existing map. At the end of 1912, I think, I remember Lord Sydenham's Government placing before the Legislative Council Mr. Kidd's report with a sketch of the Reclamation proposed. I read the report, but, as I was then a mofussil officer, I did not pay much attention to it. In 1914 or 1915, when I was Chief Secretary, I remember Mr Kemball, then Chief Engineer, trying to arrange a meeting between myself and Mr. Kidd, who was then in Bombay, with a view to a consideration of the Reclamation project. Mr. Kemball stated that Mr. Kidd was an engineer of the highest qualifications and that in his opinion the scheme was feasible and "had to come." In 1916 and 1917 I became aware that there were two big syndicates backed by Indian capital, as well as two English

firms, who were endeavouring to obtain the concession to reclaim. Having been familiar from my youth with the history and financial results of the first Back Bay Company, I was very unwilling to grant a concession to any private firm, and I was intensely relieved on my return from leave in September, 1918, to learn from my colleague, Sir Ibrahim Rahimtulla, that his proposal to have the project re-examined by a competent engineer on Government behalf had been accepted. My next recollection of the scheme is of a conversation with Sir Claude Hill in April, 1919, and the appearance on the scene of Sir George Buchanan.

Q. 7.—Between the period 16th December, 1918 (the date of Lord Lloyd's arrival), and the 31st May, 1919 (the date of Sir George Buchanan's departure from India), did you have any, and what, conversations or consultations with :—

(1) Lord Lloyd.
(2) Sir George Buchanan.
(3) Any other and what members of Government.
(4) Any and what officers of Government subordinate to you.
(5) Any and what official or officials of the Port Trust and Royal Indian Marine.
(6) Any and what officials of the Public Works Department relating to—
(*a*) the feasibility of the scheme;
(*b*) the expediency of undertaking the work at the prices of material, plant and labour then prevailing,
(*c*) or on some other and what cognate subject?

Please answer specifically in relation to each and all of the person or persons, officials or public bodies above mentioned.

A. 7.—As regards conversations with the persons mentioned in your question, I must ask the Committee to remember that the period from January, 1919, to June, 1919, was one of the most anxious periods for the British Government in India since the Mutiny, that I was the member of Council primarily responsible for the maintenance of law and order, and in that capacity I passed through a most trying time. To make matters worse, there was a bad epidemic of influenza at Mahabaleshwar in May, which laid low my colleague, Sir George Carmichael, the Chief Secretary, Mr. Mead, and my own Secretary, Mr. Thomas. I had stayed in Bombay in order that in the event of trouble there should be someone on the spot; so I escaped. But for most of the month I was doing three men's work. Consequently I find myself quite unable at this distance of time to recall conversations with individuals, with the exceptions to which I refer below. Further, it must be remembered that except as member of the Government I had no direct concern with the Reclamation Scheme. My own task—a very difficult one—was to evolve a scheme for the adequate housing of 200,000 of the working classes and to elaborate projects for the development of Bombay City which would do away with the appalling overcrowding, which was the cause of so much disease and misery. At the risk of seeming egotistical, I would add that every one from the Secretary of State downwards looked to me to accomplish this task. The "Times of India" went so far in 1918 as to make unflattering comparisons between the expectations based on my reputation as an active mofussil officer and the poorness of my performance in Bombay. Consequently I am compelled to admit that the Reclamation scheme did not occupy the first place in my thoughts. As Mr. Kemball had said, the Reclamation "had to come." Three Chief Engineers, as well as Mr. Kidd, had pronounced the project feasible, and from an intimate knowledge of land values I was certain then, as I am certain now, that all land in the first six blocks would fetch at least fifty rupees a square yard. Provided, therefore, the Engineer was competent, there was no possible ground on which the scheme could be opposed.

The exceptions to which I refer are the following :—

(1) This conversation was with Lord Lloyd.

I must premise that when I took charge of "Development" I was handed by my predecessor Sir William Sheppard a thick volume containing the evidence recorded before a committee convened by Sir Claude Hill to consider the Development of Bombay. The Committee was remarkable in that nearly every one who was anybody in Bombay was either a member or a witness; for instance, Sir Stanley Reed, Sir Ibrahim Rahimtulla, Sir Pherozsha Mehta were members: Sir Lawless Hepper was a witness. This committee, in due course, submitted a report at the beginning of which they remarked that the first question to be settled by them, on which all others depended, was whether Colaba station was to be retained or not. They answered this question in the affirmative. I held and hold the opposite opinion. Leaving on one side historical considerations, as well as those of the convenience of the travelling public, I felt that from the point of view of the Reclamation this question was one of crucial importance. Here, I reflected, was Bombay about to spend five millions sterling on a reclamation,

to which the only access from the business quarter as regards two-thirds of the land was by the level crossing at Church Gate Station, a crossing which, as the line came to be electrified, and the trains are frequent, must of necessity be closed to traffic for thirty minutes in the hour. Consequently I determined, as my contribution to the reclamation, to devote my energies to the removal of Colaba. I was encouraged in this course by the discovery, on closely examining the surroundings of the station, that its removal would make available an area which, when combined with the Cotton Green and other vacant spaces and the small reclamation on the East of the military area (see paragraph 21 of Mr. Kidd's report), could be developed into a most attractive high-class residential area (for detailed lay-out please see the plans and project prepared by Mr. Mirams).

The result of this was that when Lord Lloyd arrived I took him on his first trip, not to the classic slum areas, to which Lord Sandhurst, Lord Northcote, Lord Lamington, Lord Sydenham and Lord Willingdon had always been conducted, but to Colaba Station, the Cotton Green, the disused docks to the south of this, and to the site at which the small reclamation was projected by Mr. Kidd. Eventually, as a result of the visit, he agreed to support me in my struggle to remove Colaba, and it is pleasing to think that its contemplated removal has since received the approval of every section of the public. But the station was not the only the feature which attracted our attention. The small reclamation was obviously an easy scheme to carry through, and when combined with the vacant areas existing it might provide the additional land for which the public were clamouring in a minimum of time without any great expense. Consequently, somewhere in April, after the consideration of the big Reclamation scheme, I was summoned to Lord Lloyd's Office in order to discuss the smaller scheme with him and Sir George Buchanan.

(2) Conversation with Lord Lloyd and Sir George Buchanan.

I must remark that I did not as a rule take part in discussions of this nature because the Reclamation was not my subject; also that at the time I was so busy with my own immediate duty of keeping the peace and controlling the forces that made for disorder that Lord Lloyd and my colleagues kindly spared me as much as possible. But on this occasion I was present because the development of the eastern side of Colaba was my pet project. After the discussion, I remember that Lord Lloyd asked Sir George Buchanan whether, in the event of Government deciding to proceed at once with the smaller reclamation scheme, it would be possible to procure a small dredger without delay at a reasonable price. Sir George, if I remember right, replied that he had just been working in Mesopotamia with several dredgers, that these would shortly be for sale, and that it would be easy to procure a small dredger, which would be useful for the small reclamation and for general work. He promised to communicate with the Admiralty and let us know his views. His letter to my address, dated 24th September was, I think, it may be inferred, the result of this conversation. It was the only letter which I ever received from him, just as the conversation was the only one which I ever had with him. Consequently the purchase of this dredger was the direct result of his recommendation.

I notice in your questionnaire that you ask whether I had any conversation with the officers of the Royal Indian Marine on the subject of the Reclamation. The question puzzles me, because I cannot conceive what rights or responsibilities the Royal Indian Marine can have had outside their own dockyard. In any case they were (they have since been abolished) an Imperial Department who prided themselves on the fact that they were independent of the local Government and it was for the Government of India to see that their privileges were not infringed.

Q. 8.—Between the period 31st May, 1919, and 3rd August, 1920, did you have any, and what, conversations, of the kind referred to in the preceding question with all or some, and which of the persons or public bodies set out in the preceding question?

Please deal with each person or group of persons, or public bodies specifically.

A. 8.—I find it impossible to recall with any definiteness conversations which occurred seven years ago, except in the following cases:

I had an interview with the Viceroy, Lord Chelmsford, at which Lord Lloyd was present, in July, 1919. On this occasion the question of Bombay Development was discussed and the Reclamation was mentioned. But the Viceroy laid special stress on the urgent necessity of evolving some scheme for industrial housing and the orderly development of the city in order to enable the lower classes of the population to obtain decent habitations at a reasonable price. I had received a similar admonition from the Secretary of State personally in 1918. This was followed by an interview with certain members of the Government of India, at which the principal matter discussed was whether Colaba Station should be retained. It was decided to transfer the terminus to Grant Road, and to notify accordingly.

In August I had an interview with the most prominent mill-owners of Bombay in order to discuss various schemes for constructing industrial tenements as a co-operative or contributory basis. In the course of the discussion the plan was evolved (which was eventually adopted), of constructing these tenements by departmental agency and financing it by the levy of a town duty of one rupee per bale on raw cotton.

In August Mr. Lewis arrived on his way home and after inspection informed me that he did not consider that the Reclamation offered any difficulties.

Apart from these conversations I frequently discussed the Reclamation with my colleagues and subordinates as well as officers of other departments and members of the public. There was no question of any secrecy about the plans. I have never heard any doubts raised as to the feasibility of the work or the reasonableness of the estimates.

Note 1.

As regards your question concerning my conversations on the subject of the feasibility and cost of the reclamation between June, 1919, and August, 1920, it seems to me that the Committee are under some misapprehension regarding the place occupied by that scheme in the general development of Bombay. Your printed note states that the Committee convened by Sir Claude Hill submitted their report but that it was not dealt with owing to the War. This is incorrect. The report was under consideration for five years and the speech delivered by Lord Lloyd on 3rd August, 1920, was intended to be and was accepted by the Press and public at the time as being the views of Government on the Committee's proposals. The fact is that the Committee's report started with the enunciation of what is now recognised as a wrong principle, viz : the necessity of retaining Colaba station, and was silent regarding the policy to be pursued in connexion with the burning question of the time, the housing of the industrial classes, as well as the policy to be followed in connexion with the Improvement Trust, its future control and utilization and the general lines on which the future development of the City was to proceed. And this leads me to the enunciation of what was and still is my general conception regarding the problem facing us in Bombay. Looking back over sixty years our troubles have been nearly always due to a failure to take a sufficiently long view. The Back Bay scheme in 1866 was based on the idea that the proper place for the docks and industrial quarters of Bombay was at Chupatti and under what is now the road to Government House. It failed with a crash that brought down the Bank of Bombay. This failure was the greatest blessing that could have befallen the City. It gave Bombay its western sea-front, it led to the opening up of Malabar Hill and it relegated the docks to the eastern side of the Island. But this was entirely unforeseen. The Government of India imposed the Cotton Excise Duty in 1896. The yield was not much to start with but by 1917 had risen to something like a million pounds a years. If, instead of diverting the proceeds to Imperial purposes, some reasonable proportion had been left to the local Government to be used in subsidizing the construction of industrial tenements, we should not have had to face the scandalous state of things, which brought about the personal intervention of the Secretary of State and Viceroy in 1918. In 1909 Lord Sydenham's Government selected as the site for the Central Post Office a spot immediately facing the Eastern approach to the Victoria Terminus. If they had foreseen the removal of Colaba and convenience of bringing the long-distance Baroda trains in to the Eastern side of the Terminus, we should not, in 1920, have been faced with the objection that, owing to the Post Office, the carriage traffic could neither enter or leave the station and had to consider a terminus at Grant Road. The same Government about the same time allowed the G.I.P. Railway to erect huge carriage and wagon shops at Parel, completely blocking all traffic from Mahim to the Eastern side of the island. And so on. In my judgment the great point about the Reclamation is and was that it furnishes (in view of the completion of Block 8, I advisedly use the present tense) the administration with what the French call a " masse de manœuvre " which can be utilized to put in motion a general re-arrangement of the southern half of the City. Let us see what I mean. Block 8 is finished. Block 7 is to be put in hand at once. Blocks 1, 2 and 3 are in hand. Obviously " Colaba " must go. That removes Wodehouse Bridge, and leaves the whole of the Station with its yard free for amalgamation with the cotton green, the godown area behind and all the miscellaneous docks and prehistoric cotton presses down to the Colaba Land and Mill and transformation into a modern residential area. Next, with the purchase of Block 8 by the Military authorities the infantry barracks, hospital, and bungalows in Marine Lines will be vacated. There will be space at once for a bridge or subway connecting Blocks 1 and 2 with the business quarter of the Fort as well of course for flats suitable for housing the ordinary business man. Next to this again we now know that, as foreseen by me in 1920, the Royal Indian Marine is to be abolished, and that the Bombay Dockyard is to let. (Incidentally anyone who had seen as I did, the manner in which the 8,000 men employed in that Dockyard during the War were

housed, would say that any Government who were parties to the continued employment of a large body of artificers in this yard without providing housing accommodation ought to be impeached). The staff required for the new Indian Navy consists of a few Royal Navy Officers who can be comfortably accommodated in flats on Block 8. This will leave the whole of Campbell Park free for office or residential purposes. The greatest danger which faces Bombay and India at the present moment is Yellow fever. It is bound to come via the Panama Canal in the next ten years. When it does, Bombay has no quarantine station. The only possible site for such a station—Butcher's Island—is occupied by the Military wireless installation. Obviously this installation must and can be moved to Block 8, or if that is not big enough, to a site on the Colaba Reclamation and Bombay will be saved a repetition of the horrors of the plague visitation.

I could go on indefinitely but will not. I set down these observations as one who started forty years ago with associations with two at least of the members of the Bombay Government who were concerned in the first Back Bay scheme. For thirty years I harboured a fixed resolve to have nothing to do with any Reclamation scheme. But in 1918 I had to change.

Note 2.

There is a statement on page 13 of the printed note which appears in a different form in some of the witnesses' statements and which it would be as well to amplify, viz. : " The final sanction to the proposed taxation and to the draft bill was received in June, 1920."

The schemes conceived dealt with a number of projects of which the Reclamation was only one. From the humanitarian point of view the most important was that for industrial housing. It is important to note that this was the only project which required legislation and the only project that required taxation. And in this case the legislation as originally conceived was of the simplest kind, namely, an addition to the octroi schedule of the Bombay Municipality empowering it to levy a town duty of rupee one per bale on all raw cotton imported into Bombay, the proceeds of the duty so levied on cotton subsequently exported to Japan and elsewhere being allocated to financing a scheme for the construction of 50,000* industrial tenements and the duty on the cotton retained for consumption in the local mills being retained by the Municipality in order to finance schemes of local improvement, more especially to meet a possible loss on housing schemes undertaken by themselves or through the Improvement Trust in the North and East of the Island. It would have been perfectly simple to put this scheme before the Legislative Council by itself. But in order to give the greatest possible publicity to the views of Government, which were eagerly awaited, the whole scheme was explained in the speech which introduced this small measure, discussion was invited and special care was taken to make the Select Committee of the Council which dealt with it as influential and representative as possible. Writing from memory, that Committee included Sir Dinshaw Petit, Sir P. C. Sethna, Sir Henry Macnaughten, Sir Parsotumdas Thakurdas, Sir Chunilal Mehta, Sir Lalbhai Samuldas, Sir Goculdas Parekh, Mr. Manmohandas Ramji and Mr. E. G. Turner, I.C.S. Among these there must have been at least five, possibly six. members of the Port Trust. At the meeting of the Legislative Council, in September, which dealt with this Bill, another measure promoted by the Bombay Port Trust was taken into consideration for which Mr. Hatch, I.C.S., the Chairman of the Trust, was appointed an additional member. So that at least half the Port Trust members were present when the general scheme received unanimous approval.

Q. 9.—As regards questions 7 and 8, do you know if there exists any written record made by you of any such conversations? If so, where can it be found?

A. 9.—

Q. 10.—Did you study Mr. Kidd's report of 1912?

A. 10.—I read Mr. Kidd's report in 1912 when it was first prepared and many times since. It was a common subject of jesting 12 years ago that he drew up the estimates and at one time proposed to carry out the work, stipulating for a commission of 5 per cent. on all savings effected.

Q. 11.—Did you study Sir George Buchanan's report of September, 1919?

A. 11.—Yes.

Q. 12.—Did you appreciate that the success of the scheme depended upon the existence of a clay of a character and extent suitable and sufficient for the proposed reclamation?

A. 12.—I realized that the work involved dredging, and knew that Mr. Kidd had found sufficient material for the purpose. As to the character of the stuff to be moved I

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* *Note.*—25,000 tenements, costing £3,000,000, have been built free of charge in Bombay.

knew nothing. I presumed that it was similar to that used for the huge reclamations at the north end of the docks, which I had myself seen converted by the Sun from soft pudding-like material into hard stuff resembling " the pisa " used for building cottages on the Continent.

Q. 13.—Did you notice that Mr. Kidd described the clay as " stiff "?

Q. 14.—Did you notice that Sir George Buchanan described it as " hard "?

Q. 15.—Did you notice that Messrs. Simons & Co. in their letter of 12th September attached to the Report of Sir George Buchanan limited their specification of a dredger to one capable of dealing with " soft clay "?

Q. 16.—If you did notice it did you consult any and what person or persons and what opinion and/or advice did one or more give you? Who were they?

Q. 17.—In particular, did you on any and what date mention these discrepancies of description to :—

(*a*) Lord Lloyd,
(*b*) Sir George Buchanan,
(*c*) Sir Lawless Hepper,

or any other and what person or persons?

Q. 18.—Did you notice the broad similarity of the Reports of Mr. Kidd and Sir George Buchanan in relation to the details by which the amounts of the estimates were arrived at? (Compare page 13, Tables A and B of Sir George Buchanan's report.)

A. 13, 14, 15, 16, 17 and 18.—I cannot say whether I did or did not notice the description given by these persons of the clay. The matter was one for experts. I was far more concerned at the time with rates for reinforced concrete used in building industrial tenements and that for filling up rice land with earth in the north of the island, which were of importance in connexion with the projects, for which I was responsible.

Q. 19.—Were you generally aware that there was a great rise in prices of plant, material and labour in the year 1919 as compared with the year 1912?

Did you not know that the prices in 1919 were at least twice as high as those in 1912?

A. 19.—I knew that prices had risen but they were not as a matter of fact double those of 1912. I considered that as the currency Commission had recommended in 1919 that the rupee should be stabilized at two shillings, general prices must fall, as soon as the effects of the War had passed away. I did not foresee that when the Committee had enunciated this principle Government would let the rupee drop to 1s. 4d. in ten months. I should be a richer man now if I had.

Q. 20.—Did it occur to you that if Mr. Kidd's estimate of 325·23 lakhs was a fair and proper one it was impossible for the work to be done in 1919 and onwards at a cost of 367·61 lakhs?

Q. 21.—If you did notice this point did you discuss it with :—

(1) Lord Lloyd,
(2) Sir George Buchanan,
(3) Any official of the Secretariat,
(4) Any official of the Public Works Department,
(5) Any other and what person or persons?

Q. 22.—If so, state the substance of the conversations and the advice (if any) given by any such persons?

A. 20, 21 and 22.—It had always been understood that Mr. Kidd's estimates were too high. I considered that Sir George Buchanan's reasons for his estimates were adequate. I did not discuss whether his figures were sufficiently high or not. He had come to us with the recommendation of the Government of India, and I considered then and consider now that I was not responsible for details of a technical nature. I have dealt in the past with irrigation projects involving millions and have always been strictly warned that I was debarred from criticizing or making suggestions regarding technical matters.

I noticed in the reports of the evidence that some of the witnesses state that there was undue secrecy over the preliminary proceedings connected with the preparation of plans and estimates for the Reclamation. One at least claims to have found justification for his statement in a remark of my own in a paper which I wrote for the Royal Society of Arts. I have not a copy of the paper here, but my impression is that I intended to refer to the very large schemes of improvement contemplated in the north of the island, not to the Reclamation. The fact is that about this time values of land were so much, to use a slang expression, " on the jump " that it was necessary to be ultra-careful in order to avoid leakage. An instance of this occurred in the case of the Colaba scheme, the estimates for which were entirely upset by the gambling which took place in

the shares of the Colaba Land and Mill Company, due to the fact that the existence of the scheme became known in May 1919. The situation was complicated by the fact that there were numerous proposals involving the acquisition of land, some in Bombay Island, some in Salsette, which had nothing directly to do with the Development scheme. I may mention the following : Removal of Jail, removal of Mint, removal of Government Press, removal of Technical Institute (since carried out), removal of Byculla schools (since carried out), removal of B.B. & C.I. workshops (now proceeding), removal of G.I.P. workshops (decided on), construction of Mussulman College (proceeding I believe), construction of Edward VII Hospital (completed), construction of aerodrome (completed), removal of headquarters of Thana district etc. It is, I submit, obvious that in launching big schemes involving large acquisitions in the north of the island it was necessary to secure as much secrecy as possible. But this did not apply to the Reclamation.

G. S. CURTIS.

VIII.—SIR CLAUDE HILL'S REPLY TO THE COMMITTEE'S INVITATION TO HIM TO GIVE EVIDENCE.

Government Office,
Isle of Man.
8th October, 1926.

My dear Ewbank,

I have received your letter of the 6th October, with enclosures, and I write to say that my official engagements here preclude the possibility of my absenting myself from the Island within the next ten days, or indeed during the month of October.

In regard to the first of the terms of reference of the Back Bay Inquiry Committee, I would refer you to the Bombay Development Committee's Report of 1912/13. That Committee was presided over by me, and the Report represents my views at that date as to the need for expanding the area of the southern portion of the Island of Bombay, and for developing the North of the Island. I have reason to believe that that Report was the foundation upon which was later developed the detailed scheme of Back Bay Reclamation. I have nothing that I can usefully add to it as to the urgent need for providing an enlarged area round the business centre of the City. I believe that the views then expressed were sound and are so still.

I have perused the questions drawn up by the Committee, but I cannot see that I can give the Committee answers to any of them, as I left the Government of Bombay in April, 1915, and have not had first hand contact with the Reclamation problem since that date.

As Member of the Viceroy's Council in charge of the Public Works Department, I was made acquainted officially with the project for proceeding with the Back Bay Reclamation Scheme which had been foreshadowed and recommended by the Bombay Development Committee. I was naturally in favour of the scheme in the abstract, but the Government of India's interest and responsibility in connection with the scheme as submitted was limited to the technical and financial aspects of the project. On the technical side the Committee have already had the advantage of hearing the evidence of Sir Sidney Crookshank, who was my technical adviser on the scheme when it came under examination in the Public Works Department; and I could add nothing to what he has said. The investigation of the proposals on the financial side was made in the Finance Department.

Reverting to the second of the terms of reference of the Committee—namely, " to make recommendations as regards future operations "—I do not imagine that I could furnish material help to the Committee, since anything I could say would be merely matter of opinion. I would only like to offer the remark that I noted with approval that one or two of the witnesses examined (as reported in the " Times ") have drawn attention to the fact that the whole project was not merely a scheme designed to be profitable financially, but one to meet the urgent needs of the City of Bombay if she is to expand and develop, and at the same time to safeguard the health and amenities of the inhabitants. For what it is worth, my opinion is that if it is at all possible to finance it, the whole scheme should be carried to completion. It is, in my opinion, the sole means whereby the future expansion of Bombay can be assured.

Since, as I have already stated, I am not able to answer any of the questions, and since this letter states all that I am in a position to state, I venture to think that the Committee will not consider it worth while that I should come to London.

Yours sincerely,
(Signed) CLAUDE H. HILL.

R. Ewbank, Esq., C.I.E.
6, Richmond Terrace,
Whitehall, London, S.W.1.

IX.—REPLIES OF THE G.I.P. AND B.B. & C.I. RAILWAY ADMINISTRATIONS TO THE COMMITTEE'S INQUIRIES REGARDING THE TRANSPORT OF MOORUM.

Copy.

GREAT INDIAN PENINSULA RAILWAY.
Agent's Office,
Victoria Terminus,
Bombay.
27th August, 1926.

No. 12640 H/6.

R. B. Ewbank, Esq., C.I.E., I.C.S.,
Secretary,
Back Bay Inquiry Committee, Bombay.

Dear Sir,

Your Letter No. 441, *dated* 21/8/26.

In reply to your letter quoted above, I beg to inform you that it will be possible for this Administration to work 10 trains of moorum into Bombay daily provided a fixed time table is worked to, and also provided the B.B. & C.I. Railway are able to take them over from us at Dadar Junction.

2. The charge for a train of 50 wagons, each of 16-ton capacity, will be Rs. 225/- per train This does not include the supply of trucks. It is understood the Bombay Development Department could supply a certain number, and this railway would be asked to supply the balance. The charge for G.I.P. Railway trucks with be Rs. 2/8/0 per truck per day, this, of course, in addition to the train charge quoted above.

Yours faithfully,
(Signed) T. G. RUSSELL,
Ag. Agent.

KSP

Copy.

BOMBAY, BARODA & CENTRAL INDIA RAILWAY COMPANY.
Agent's Office,
Bombay.

No. T/230.

27th August, 1926.

From The Agent
To R. B. Ewbank, Esq., C.I.E., I.C.S.,
Secretary,
Back Bay Inquiry Committee, Bombay.

Subject:

Carriage of ballast trains of the Bombay Development Department.

Dear Sir,

With reference to your letter, No. 442, of the 21st inst., and the interview I had yesterday with Sir M. Visvesvaraya and Sir F. T. Hopkinson, I understand the Committee desires to have a reply before sailing for England on Saturday. In the short time available I have not been able to examine the matter in great detail, but I give below an estimate of what we could do. As intimated in your letter, this estimate is to give an idea of the position, and is not to be taken as a definite undertaking.

At the interview of yesterday I gathered that, in addition to 10 trains a day from quarries on the B.B. & C.I. Railway, the possibility of running 10 trains a day at the same time from quarries on the G.I.P. Railway should be considered. These 10 trains would come on to this railway at Dadar Junction, and thus 20 trains a day would have to be dealt with from that point to Chowpatti Junction.

I estimate that we could take this number of trains a day from the time that the erection of our electrification overhead gear is completed, but it would require close working, and it would be essential that the trains should be worked rigidly to a time table which would be fixed with reference to our services. It would be necessary for the Development Department to provide ample facilities in the way of reception lines, etc., at Kandivli and Chowpatti to permit of working to such a time table.

It will not be possible for us to take more than four or five trains a day until the erection of electrification overhead gear is completed. The date for completion of this work is the 1st May, 1927, but some delay is anticipated owing to the coal strike in England. The extent of this delay is not known, but for purpose of estimating it might be taken as three months.

The Bombay Development Department at present run two trains a day from Kandivli, and the scale of charges is :

(1) Rs. 300/- per train when only one train is run per day.
(2) Rs. 275/- per train when two and up to four trains are run per day.
(3) Rs. 250/- per train when over four trains are run per day.

I estimate that we could quote Rs. 225/- per train for over six trains a day, and we might be able to quote Rs. 200/- per train for 10 trains.

These charges are for trains from Kandivli to Chowpatti, and do not include the supply of trucks. The Bombay Development Department at present supply their own trucks.

I understand that the railway would be asked to supply the balance of trucks required. The number required for 10 trains a day would depend on the rate at which they were turned round. I think, however, that we could supply all that would be required either from our own stocks or from other railways. The charge for trucks supplied by this railway would be Rs. 2/8/- per diem per truck, this being in addition to the train charge quoted above.

Yours faithfully,

(Signed) M. W.,

for Agent.

X.—BOMBAY GOVERNMENT'S PRESS NOTE, DATED 16TH OCTOBER, 1926.

BACK BAY RECLAMATION.

Government Decide to Complete Block 7.

An *ad interim* report submitted by the Back Bay Enquiry Committee at the request of the Government of Bombay regarding the next season's work has been published for general information by the Government of India.

2. In that report the Committee unanimously recommend the reclamation of Blocks 1, 2 and 8; block 1 by dredging from Back Bay in the next working season, and thereafter both blocks 1 and 2 by either dredging or dry filling, whichever may prove more economical or advantageous. The dredger, they say, should work three shifts. Block 8 should be completed as quickly as possible by dry filling. Storm-water drains 6 and 7 in blocks 1 and 2 should also be completed, and parapets in blocks 1 and 8 constructed in due course. This recommendation, confirming, as it does, the recommendations of the majority of the Advisory Committee and Mr. Kay's Committee, has been accepted by the Government of Bombay, and work in blocks 1 and 8 will proceed accordingly during the ensuing working season.

3. With regard to block 7, the Committee note that its area is 6,54,000 square yards, and that the quantity of dredged filling required to fill this block is two million and fifty thousand cubic yards. They consider that if the dredger is worked efficiently for three shifts daily, the block should be completed, so far as the dredged material only is concerned, in the course of the season, at a rate of eight annas per cubic yard, and that this rate is much below the cost of any other method of filling at some future date. The cost of moorum topping, development, interest and depreciation has, of course, to be added to this. The Committee note also that dredging plant is available on the spot, and that the superior staff cannot be dispensed with without six months' notice. At the same time, they are impressed with the uncertainty regarding the date and rates at which the land, if reclaimed, could be disposed of, and this makes them doubtful if it would be a sound proposition financially. They therefore consider, in the circumstances, that it is for the local Government to decide for themselves whether any action, and if so, what, should be taken in respect of this block pending the decision of Government on the final report of the Committee.

4. In paragraphs 30 and 31 of their report, the Kay Committee recorded their conclusion, on the figures of cost adopted by Mr. Neilson's Committee, that the present value of the total cost of completing block 7 would amount to Rs. 48.50 lakhs, as compared with Rs. 36.97 lakhs, the estimated present value of the recoupment, and that the reclamation and development of the area would not be a paying proposition. They accordingly recommended that the reclamation of block 7 should not be proceeded with at present.

5. Government have now re-examined the financial aspect of the completion of this block in the light of the remarks made by the Back Bay Enquiry

Committee in their *ad interim* report, with the following result. It would not be possible to work the dredgers three eight-hour shifts until additional staff could be obtained from England, and it would be necessary to provide accommodation on shore for the extra men, as that on the dredgers is fully occupied. It is quite possible, however, under suitable arrangements, to work the plant two 12-hour shifts with the existing crews; and it is estimated, on the actual figures of the season 1925-26, that, if this is done, it should be possible to obtain an output of 20,21,300 cubic yards of consolidated filling during the coming season at a cost of Re. 0.62 per cubic yard, based on the total working costs of the plant incurred, and to be incurred, during the period 1st June, 1926, to 31st May, 1927.

6. As regards the output, the quantity of dredged filling required to complete block 7 is 20,50,000 cubic yards, which is slightly more than the estimated output of the plant for 2 twelve-hour shifts, based on the actuals of 1925-26. During that season, however, 17 working days were lost owing to the necessity of stiffening the Colaba, and 10 working days on account of bad weather, and there seems no reason to suppose that in a normal season's working, with 2 twelve-hour shifts, the quantity of dredged filling required for block 7 cannot be obtained.

7. In regard to the rate, this, as stated above, is estimated at Re. 0.62 per cubic yard, which includes, however, the expenditure on dredging staff, maintenance, etc., already incurred during the current year since the close of the last dredging season on 31st May, 1926. Moreover, if it is decided to abandon dredging, the present superior staff have to be given 6 months notice. These two items total Rs. 3.50 lakhs and represent expenditure, which cannot in any case be avoided, corresponding to a cost of Re. 0.17 per cubic yard of consolidated filling. Allowing for this, the difference between the rate of Re. 0.50 per cubic yard suggested by the Back Bay Inquiry Committee, and the departmental estimate of Re. 0.62 per cubic yard, is only Re. 0.05, and it seems reasonable to suppose that the rate given by the Committee represents the additional expenditure in which they consider Government will be involved, if it is decided to continue dredging during the coming season, the fact that the departmental estimate is slightly lower being probably due to its being based on 2 twelve-hour, instead of 3 eight-hour, shifts.

8. Apart from the question of output and rate due to working the plant 24 hours per day, Government are of opinion that in one other respect the forecast on which Mr. Kay's Committee based their conclusions may reasonably be modified. The forecast is based on the assumption that the disposal of the land will take 20 years, but provision is made for the completion of the development, i.e., roads, drains, lighting, etc., in 5 years. It is unusual to undertake such expenditure so far in advance of actual disposal of the land, and it is considered reasonable to spread it over 15 years, the development being completed, even then, 5 years before the last plot is sold.

9. On the basis of working the plant 24 hours per day, and taking 15 years for the development of the area, the financial position is estimated to be as follows :—

COST OF RECLAMATION.

Season 1st October, 1926, to 31st May, 1927.

	Rs. lakhs.
(*a*) Moorum filling (sealing wall and bund) 1,44,000 cubic yards @ Rs. 1.57	2.26
(*b*) Dredged filing 20,50,000 cubic yards @ Rs. 0.62	12.71
	14.97
Establishment charges @ 15 per cent.	2.25
	17.22
Deduct expenditure already incurred or inevitably to be incurred	3.50
	13.72

Assuming this expenditure to be evenly distributed over the eight months, and writing it back to 1st October, 1926, the present value cost on that date would be Rs. 13.45 lakhs.

Season 1927-28 No work done.
Season 1928-29 } Work of moorum topping to be spread over these two years.
Season 1929-30 }

	Rs. lakhs.
Moorum topping	
5,84,000 cubic yards @ Rs. 1.57	9.17
Establishment at 15 per cent.	1.38
	10.55
Written back from 1st April, 1929, to 1st October, 1926, i.e., $2\frac{1}{2}$ years, the present value cost is	9.12
The total present value additional cost of reclamation is therefore	
13.45 *plus* 9.12	22.57 lakhs.

10. *Cost of Development.*—Mr. Kay's Committee assumed that the gross area of 6·54 lakhs square yards in block 7 would yield a net building area of 3·40 lakhs square yards based on Mr. Davidge's provisional lay-out. This can be increased by a further 60,000 square yards by (1) throwing part of the proposed recreation ground into the building area, and (2) reducing by 20,000 square yards the area under roads. Thus a total building area of 4·00 lakhs square yards can be obtained, and the cost of development be reduced by Rs. 2·40 lakhs. This Rs. 2·40 lakhs may, for purposes of the forecast, be taken to balance the extra expenditure which Mr. Kay's Committee anticipate may have to be incurred on temporary arrangements for disposal of sewage. Taking then the figure accepted by Mr. Kay's Committee, Rs. 26·5 lakhs, as the cost of development spread over 15 years from 1930-31, the present value of the expenditure on 1st October, 1926, would be Rs. 13·96 lakhs. The total present value of the cost of completion of block 7 is, therefore :—

Present value cost of reclamation	Rs. 22·57 lakhs
Present value cost of development	Rs. 13·96 lakhs
Total present value cost of completion	Rs. 36·53 lakhs

11. *Recoupment.*—4·00 lakhs square yards at Rs. 25/- per square yard spread over 20 years, i.e., 20,000 square yards per year, bringing in Rs. 5 lakhs per annum for 20 years from 1931-32.

The value on 1st October, 1926, of Rs. 5 lakhs per annum for 20 years from 1931-32 is ... ... 45·43 lakhs

According to this forecast, therefore, if the plant is worked 24 hours a day during the coming season, and the cost of development is spread over 15 years, the completion of block 7 will result in a reduction of debt at present value of 45·43 − 36·53 = Rs. 8·90 lakhs.

12. There are two subsidiary points raised in the report of Mr. Kay's Committee in regard to block 7. The first is as regards the supply of moorum, paragraphs 22 and 23 of the report. The fear is expressed that if block 7 is undertaken, the diversion of moorum, for sealing the sea wall and bund, may prevent the completion of block 8 by the estimated date 31st March, 1928. Government have had this matter investigated and have ascertained that arrangements have already been made with the B.B & C.I. Railway for doubling the supply of moorum with the existing rolling stock, with the result that not only will there be sufficient moorum for block 7, but the completion of block 8 can be considerably accelerated.

13. The second point is that of sewage disposal in block 7, dealt with in paragraphs 26 and 27 of the report of Mr. Kay's Committee. It will be seen that the Committee apprehended very considerable expenditure on temporary sewage disposal arrangements, owing to the probability that the construction of the proposed municipal outfall at Colaba might be indefinitely postponed. On an examination of the conditions it has been found that it will be quite possible to lay the system of sewers in the area in their final position, and, pending the construction of the municipal intercepting sewer, to provide a sump from which the sewage can be pumped into a septic tank, the effluent from which will

flow into a neighbouring storm-water drain. The additional cost of the temporary work, over and above the cost of the sewers included in the cost of development, will amount to approximately Rs. 1·13 lakhs which will be more than covered by the saving, Rs. 2·40 lakhs, due to the proposed reduction of the area under roads.

14. After taking all the factors in the case into consideration, Government have come to the conclusion that the balance of advantage is in favour of the completion of block 7, and they have accordingly decided to proceed with dredging from the harbour into block 7 during the coming season, working the plant 24 hours a day.

Government do not propose to take any further action until they have had an opportunity of considering the report of the Enquiry Committee appointed by the Government of India.

(59483c) P 1283—572 500 12/26 H. St.

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